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Intense Patriotism at Institute Meeting

Members Stand Loyally Behind the Government—Many Send Sons to War—Gary, Schwab and Other Leaders Speak with Deep Feeling—Large Attendance at Cincinnati

THE thirteenth general meeting of the American Iron and Steel Institute held at the Sinton Hotel, Cincinnati, last Friday, was dominated by a spirit of intense patriotism. The two business sessions and the banquet were held in a hall elaborately and beautifully decorated with the colors of the United States and its Allies and all of the proceedings were in harmony with the display of the beautiful flags. The speeches were uniformly marked by expressions of loyalty to the Government. The singing of patriotic songs was a feature and the feeling at times was so intense that the delightful humor of some of the prominent members, especially Mr. Schwab and Mr. Butler, was welcome, for it relieved the strain without any undue levity, for no man who spoke was more positive in his loyalty than Mr. Schwab or Mr. Butler. There was possibly a little disappointment that Judge Gary, in his opening address, did not give more specific information in regard to the plans of the Government concerning price fixing. But after all, the proceedings at Washington are regarded as details and the general plan of supporting the Government was enthusiastically supported. As President Farrell remarked, "If Germany should win we would not be thinking about prices."

The attendance was large for a meeting held outside of New York, as 600 members and guests were registered, and 580 attended the banquet. The hospitality of Cincinnati was dispensed under the leadership of such members as D. B. Meacham and James I. Stephenson, the chairman of the committee on arrangements, and was of the heartiest kind. The welcome extended by the American Rolling Mill Co., Middletown, Ohio, and the Andrews Steel Co., Newport, Ky., whose plants were visited by numerous members Saturday, was also extremely cordial. Hon. Charles P. Taft, although not a member of the Institute, took a leading part in the entertaining, and the visit to his home, where his magnificent collection of paintings was inspected, was highly appreciated. The members evinced keen interest in inspecting the much-discussed Barnard statue of Lincoln, which is located a short distance from the Taft home. The luncheon at the Country Club, at noon Saturday, was greatly enjoyed.

While it is always a pleasure for the members to greet their time-honored leaders and hear their words of wisdom, it is likewise highly gratifying to recognize younger men who appear on the program, and of the men of this class at the Cincinnati meeting Eugene P. Thomas, president United States Steel Products Co., and Nicholas Longworth, member of Congress from Cincinnati, carried off the greatest honors.

The opening session Friday morning will never be forgotten by those who attended, for following the able address of Judge Gary came a number of short, informal speeches, of which patriotism was the keynote. A number of those who spoke had demonstrated their loyalty to their country by sending their sons to the front. Judge Gary was so deeply moved that it was difficult for him to speak on this subject. President James A. Campbell of the Youngstown Sheet & Tube Co., when called upon, spoke only a few words, but his sentiments were enthusiastically received. "There is not," he said, "much worth while in this world to-day except to win the war."

President Robert Hobson, Steel Co. of Canada, paid a tribute to what he called "the magnificent silence of the press." He told how he had known of the leaving of many thousands of troops by way of Halifax, but not one word had appeared in the newspapers.

Joseph G. Butler, Jr., vice-president Brier Hill Steel Co., Youngstown, Ohio, spoke of the splendid record made by Youngstown in subscribing to Liberty bonds. He said the city had been given the raising of $5,000,000 in bonds, but that two companies had subscribed that amount. Mr. Butler referred to the criticism by Champ Clark—which has since been retracted by the Speaker of the House—in which he had alleged that a coterie of financiers was discouraging the subscribing to Liberty bonds. Mr. Butler severely condemned this utterance.

Following Mr. Butler's brief remarks, Judge Gary said that he did not feel disposed to question the loyalty of Speaker Clark, whose son is a soldier in the National Army. He believed that if Mr. Clark could visit New York and ascertain the facts he would realize the injustice of the statement which he had made. Judge Gary then paid a hearty tribute to President Farrell, saying that he had been working night and day to do his bit in helping to carry this war to a successful conclusion. "I know," he said, "that Mr. Farrell does not feel like talking, for he has sent his two boys to war, but we must have a few words from him."

Mr. Farrell spoke briefly, referring especially to the importance of carrying out the shipbuilding plan of the Shipping Board. He said that it was proposed to construct 3,000,000 tons of vessel capacity in 18 months, and this would support 700,000 soldiers in foreign lands; but fully double that tonnage must be built. There is the great importance of all connected with the industry working together. "If we lose," he said, "we will not be thinking of prices. Let us help one another and help the Government. While we are hopeful that the war will be over in the spring, I fear

it will be a long struggle; a great deal depends on the men in this room."

W. A. Rogers, of Rogers, Brown & Co., who has two sons in the army; President Clarence H. Howard, Commonwealth Steel Co., St. Louis, and others, spoke briefly. Then Mr. Schwab was called on, and, as usual, was most enthusiastically greeted by the audience. He told an amusing story of his troubles in borrowing money to subscribe for the Liberty Loan. He said that he had gone to numerous bankers in New York, and told them he wanted all the money he could get. The president of one bank said to him: "Why, Mr. Schwab, don't you know that you already owe us $2,000,000?"

"Oh," he said, "I had forgotten all about that."

Mr. Schwab, in commending Judge Gary's speech, said it was a natural outpouring of the heart, on account of having been hastily prepared. He said that of the 80,000 employees of the Bethlehem Steel Corporation and of the 600,000,000 tons of orders on books, 90 per cent was of Government business. He was proud and happy that it was his privilege to have a share in directing this great work for the Government. He spoke of the conference at Washington, and said that Judge Gary's policy had been broad-minded, not being for the benefit of any particular company or class of people, but to promote the best interests of all concerned.

Following Mr. Schwab's remarks, Judge Gary called upon all those present to rise who were willing to do their utmost to increase the production of iron and steel and help the Government in every way. The entire audience arose, after which there was the singing of America.

Patriotic Speeches Made at the Banquet

Congressman Longworth Tells About the Billions Appropriated—Mr. Butler Pays His Respects to Senator LaFollette—Other Responses

The banquet Friday evening was opened by the singing of the "Star-Spangled Banner." Judge Gary was toastmaster and introduced Hon. Charles P. Taft as "Cincinnati's First Citizen." Mr. Taft spoke briefly, dwelling principally on the Liberty loan and the splendid record which had been made by Cincinnati. He referred to the time when Cincinnati borrowed $10,000,000 to help the building of a Southern railroad, on which it paid 7.3 per cent interest, while now the city has subscribed for $38,000,000 in Liberty bonds, on which the Government will pay only 4 per cent interest.

Hon. Nicholas Longworth said it seemed like the irony of fate for a member of the Ways and Means Committee of the present Congress to be introduced to an audience of manufacturers of steel after that committee had been such an important factor in lowering the tariff and raising taxes, but he wished heartily to commend the attitude of the manufacturers of iron and steel for their unselfish action in regard to matters pending in Congress during the past few months. He said that only a few months ago it was estimated that it would be necessary to appropriate $4,000,000,000 for war expenditures. Congress was finally called upon to appropriate very much larger amounts, and the appropriations for the session amounted to $21,500,000,000, a sum 20 times the National debt before the war and four times as great as the total debt of the country, the states, the cities, the villages and townships of the United States. He compared the appropriations of the United States with the expenditures up to date of foreign countries, showing that the United States is already far in the lead; but he called attention to the fact that of the total appropriations, $7,000,000,000 was for loans to the Allies, $2,500,000,000 was for contracts, and a considerable part of the expenditures will add to the permanent wealth of the Nation. He said he believed that not more than 25 per cent of the cost of the war should be paid for by taxation, and this declaration was received with hearty approval. He insisted, however, that no matter how much the war may cost, it must be fought to a finish, so that peace will be permanent and for all the world.

Commenting briefly on Mr. Longworth's speech, which he highly praised, Judge Gary said that the present war shows that we have all been too selfish, too much devoted to business, and he warmly commended the men and women who are now doing their duty to their country.

Frank Billings of the Tod-Stanbaugh Co., Cleveland, spoke of the splendid work which is being done at Cleveland by the bureaus which were organized to manage the movement of iron ore and coal during the present season. He also spoke of other modern methods of transacting business.

When midnight arrived Judge Gary said: "The formal part of the program is ended; what is your wish?" Immediately from all parts of the hall came shouts for "Schwab," "Schwab." The popular chairman of the Bethlehem Steel Corporation responded with another happy speech. He told some stories, but also spoke in a serious vein, saying the time had come not only to talk patriotically but to act patriotically.

Calls by the audience for "Uncle Joe" brought Joseph G. Butler, Jr., of Youngstown, to his feet. He told of his experience at a recent meeting at Atlantic City at which he had advocated the sending of Senator LaFollette to Germany just as President Lincoln had sent another "copperhead," Vallandigham of Ohio, within the Confederate lines during the Civil War. Mr. Butler said that his speech at Atlantic City had not attracted much attention in the newspapers, but later the same idea was taken up by ex-President Roosevelt and thoroughly exploited by the press of the country. He facetiously charged the ex-President with stealing his thunder.

President Farrell was then called upon and responded briefly, speaking in words of high commendation of the Cincinnati committee on arrangements for the meeting. Other speakers were Capt. Robert W. Hunt, Chicago; C. H. Howard, president Commonwealth Steel Co., St. Louis; H. C. Bush, Cincinnati; J. H. Dempsey, Cleveland; George P. Early, American Steel & Wire Co., Pittsburgh, and Robert W. Campbell, Illinois Steel Co., Chicago.

D. B. Meacham Extends Hearty Greetings

Many Industries of the Queen City—Living Up to Ideals of Many Years Ago—Its Influence on Culture

In welcoming the members of the American Iron and Steel Institute, D. B. Meacham, partner of Rogers, Brown & Co., said:

"Cincinnati greets you most cordially. We appreciate the honor conferred on us by the presence of this institute, with the attendance of men so distinguished in the world of iron and steel.

"Your patriotic support of the Government and your

untiring, self-sacrificing efforts in assisting to prepare for and prosecute the war are well known. You are recognized as leaders in the humanitarian movements which are designed to improve the living conditions of your employees and to bring about a closer relation between capital and labor. Notwithstanding the many difficult problems facing you during these unparalleled times, we hope you will all remain to-morrow, and allow us to offer you a day of social entertainment.

"The topic assigned to me is 'Cincinnati and Its Industries.' Every city has its individuality and its characteristics seem to be perpetuated. In a book entitled 'Cincinnati in 1841,' by Charles Cist, is the following:

> The whole mechanic interest here has long since discovered that if they meant to supply this market with what formerly came from the Eastern cities, it would not do simply to make as good work, for the weight of prejudice and fashion was against them, and unless they could show an article which was manifestly of better materials, more neatly or more strongly put together and finished in a higher degree, they felt it was impossible for them to overcome the force of the current. We then made it a settled principle at all hazards and sacrifices to drive out the Eastern article. We knew that we had as good or better materials; that the right kind of workmen could be got, and as long as we met our expenses we must for so desirable an object wait for our profits until we could carry our point. The best workmen were accordingly engaged and brought out at high wages, and every effort made to instruct our apprentices on the latest improved patterns and models, and in the course of a few years by the time our boys became journeymen, or went into business for themselves, we accomplished our purpose, and there is now not $5 worth of work brought out here where $1,000 was imported ten years ago. The whole competition here is who *can* make the best piece of goods, not who *will* make the cheapest one.

"The determination in 1841 to make only the best has been consistently adhered to by our manufacturers, and that is the reason why Cincinnati products are famous throughout the world. Cincinnati occupies about 72 square miles, with a population of 410,000. Including the contiguous cities on both sides of the river, the population of this industrial district is about 600,000. The United States census of 1910 showed that 79 per cent. of the people were native Americans, which was a greater proportion than that of any other large city in the United States. In 1910 male aliens over 21 years of age formed only 2 6/10 per cent. of the population. The principal products of manufacture are: Machine tools, soap, rolling-mill products, clothing, boots and shoes, printing and publishing, slaughtering and packing, furniture, lumber products, leather, sheet metal, special machinery, printing inks, chemicals, wood-working machinery and women's clothing.

"A distinctive and unique feature of Cincinnati is its wide variety of substantial industries. According to the United States census of 1914, in this industrial district there were 2623 manufacturing establishments, and these included 92 of the 264 industries recognized by the census. This diversity of industries is an exceedingly valuable asset to a city, and gives it advantages over one that is dominated by a single line.

"The National Social Unit Organization made a careful and widespread survey and selected Cincinnati as the most typical American city and one in which the citizens of all nationalities and beliefs worked in best accord for social betterment, and its first experimental station is established here. Our people have a firm conviction that the real success of an industrial city rests chiefly on a well educated, self-respecting working population. Many agencies are operating efficiently to bring about the results desired.

"I could tell you of the historic past of our city and of its varied industries and achievements; of its place in the musical world; of its colleges and conservatories of music with thousands of students from the great South and Southwest; of its unexcelled Symphony Orchestra and its Music Festival, which was the pioneer of those now held in various cities. Regarding these musical festivals the highest authority writes:

> They have beyond question exerted a more powerful influence for musical culture than any other institution of their kind

"Our Zoological Garden is said to be the best in the country. Our Exposition was the forerunner of the one held in Philadelphia in 1876, which had our director in charge. Our Art School has started on their careers many of the most noted American artists. Our city owns a railroad, a profitable asset, which it had the foresight and sagacity to build to open up the South. It has a great municipal university, with thousands of students, which has introduced vocational methods now being extensively copied; and its new general hospital is one of the largest and best in the world. The Cincinnati water works demonstrated to other river cities the possibility of eradicating that awful scourge, typhoid fever. I could emphasize the beauties of our residential sections and our 2500 acres of parks, but some of these we expect to show you tomorrow.

"An address like this is occasionally a vehicle carrying a heavy burden of statistics, but our committee has guarded against too great a tax on your patience by presenting to each member a copy of The Citizens' Book, which contains a series of carefully prepared articles by well qualified writers, covering the various functions of our city's life. It is used by all our public school teachers, and is, I think, an example in an educational line that other cities would do well to follow. Please read it and take it home to your children, so that the rising generation also may know more about the 'Queen City.' Allow me to call especial attention to its introduction:

> This is a book for the citizen; for the citizen who would know what his city was, what it is, and how it became so; for the citizen who wants his city to grow better, who has ideals for its improvement, or who is seeking for such ideals; for the citizen who is willing to work with others to help make Cincinnati a community which contributes the greatest possible good to each of its members.

"In closing we again thank you for coming, and hope that when you depart you will carry away many pleasant recollections."

Judge Gary Tells of Work at Washington

Calls for Hearty Support of the President—Reviews the War's Progress and Emphasizes the Importance of the Part Steel Makers Are Taking

After calling the meeting to order, Judge Gary said: "At the last annual meeting of the Institute reference was made to the appointment and the activities of a general committee and sub-committees of the iron and steel industry. These committees were appointed and were serving as auxiliary to the Advisory Committee of the Council of National Defense. However, in view of special legislation of a recent date concerning transactions of a business nature between the Government and private interests, it was, from an abundance of caution, decided to abrogate the appointment of these committees; and immediately thereafter your president, after consultation with his associate directors of the Institute, named a general committee and also sub-committees representing the different special lines of the industry. The general committee and also the sub-committees, directly or through the general committee, have been reporting their recommendations from time to time to the War Industries Board at Washington consisting of Frank A. Scott, chairman; Judge Robert S. Lovett, Robert S. Brookins, Bernard M. Baruch, Hugh Frayne, Admiral Frank F. Fletcher and Col. Palmer E. Pierce. This board in turn has reported its recommendations to the President for decision. From the published accounts you are familiar with the results which have been reached.

Many Disappointed

"Many of you were disappointed when the prices of the commodities in which you are particularly interested were announced. You had expected larger figures. You had been receiving from your customers, in the

ordinary course of trade, much more favorable results. Your profits will be less than you have believed you are entitled to. Your costs of production and construction are increasing by leaps and bounds. Many manufacturers have struggled for existence in periods when business conditions were bad, trusting to the future for improvement, and they have argued that if the law of supply and demand should govern under such circumstances it should control at all times.

"All these things have been considered by the iron and steel committees, and by the representatives of the Government as well. It is only stating facts to say that the former have endeavored to represent the manufacturers conscientiously, intelligently and forcefully and that the members of the War Industries Board have at all the hearings given patient attention, thorough investigation and careful consideration to every claim presented, with the sole purpose of doing justice both to the Government and to the individual.

Insisted Upon Higher Prices

"The members of our committees have insisted upon higher prices than the ones finally agreed upon, but they consented to those which were fixed because they were influenced by motives of patriotism and also because they were convinced that, in the main, the prices came within the original proclamation on the subject by the President which, from the standpoint of the Chief Executive of the nation, was reasonable.

"If, as between the different products, semi-finished and finished, disparities in prices are discovered, then, so far as practicable, they should be removed. The intention of every one connected with the ascertainment of facts and the determination of prices is above reproach.

"It may be suggested that some of the producers may realize larger profits per unit than others owing to greater diversity of commodities, favorable location, better organization, larger production or other facilities which tend to lower costs, but, if so, the progressive rates of Governmental excess profits tax, depending upon the relative net earnings of the different producers, will largely offset the differences in net result. It is estimated some of the manufacturers will be obliged to pay to the Government as high as 50 per cent excess profits tax.

The Committee's Work

"The committee representing the steel industry has labored hard and faithfully in the performance of its duties. It has carefully considered every suggestion which has been made, from time to time, by those engaged in the industry relative to their rights, interests and claims. The facts concerning capacity, advantages or disadvantages, and the claims of cost and profits of each, have been gathered, so far as practicable, with the purpose of determining the relative positions, rights and obligations of all; and these have been honestly presented to the War Industries Board, and, before its appointment, to the Secretaries of War and Navy, and to various boards created by the President or by the Council of National Defense. The general committee has met frequently in New York and Washington, giving these matters attention in preference to all others and regardless of personal comfort and often without adequate rest. Omitting the chairman, who has been frequently relieved of work and favored in many ways, I state with emphasis for the benefit of those who are not fully informed that the other members of the general committee, as well as the members of the sub-committees, are entitled to the gratitude of all others who have been interested in this work. In the collection and distribution of figures affecting the different branches of inquiry the American Iron and Steel Institute has rendered valuable assistance and is entitled to and has received much praise from the members of our committees and also from the Government's representatives.

Efficient Agencies at Washington

"And the members of our committees, better than those who have not had similar experience during the last year, recognize with appreciation the comprehensive and efficient work that has been and is being done by the large number of Governmental agencies in Washington. There has been created a vast business organization, with scores of departments, and a larger number of sub-departments, which are carrying on the greatest of all great business undertakings; and, notwithstanding the unfavorable criticisms which have been made, many, if not most of which, are wholly unjustified, it should, in truth, be said this colossal combination of diversified, ramified and intricate business activities, involving almost every phase of political, social, commercial, financial and industrial life, is being, has almost been, whipped into a smooth running machine. That mistakes have been made, that steps have had to be retraced, that sometimes action has been too hasty and other times too deliberate, that red tape rules, created by legislation or otherwise, occasionally have interfered with the best results, may be assumed; but with patience, skill, persistence, vigor and success, the great varieties of business enterprise as time elapsed have been better and better co-ordinated and the whole structure developed nearer and nearer to the point of perfection. I do not hesitate to say that, so far as there has been opportunity to observe, the results in Washington have excited my surprise and admiration.

Management of Business Men

"The most wonderful feature of this work is not its magnitude, nor even its results, which are becoming exposed to the view of the general public, but rather it is the fact that the work is very largely under the management of very able business men and women who are volunteers and are devoting their time and skill and energy without compensation, or hope or desire for reward of any kind, except in the consciousness of duty performed. There are large numbers who have disregarded personal interests, their personal comfort, and many, even their personal health. These men and women are outclassed, in disposition to sacrifice and serve, only by the members of the Army and Navy who bare their breasts to the destructive forces of warfare.

"Of this vast civil army of effectives, before which the representatives of the institute and its members have appeared, is the War Industries Board, already referred to. The members of this board have other matters of interest which need attention. Some of them had hoped to retire from active business and to enjoy a well earned rest; some of them are in the very prime of life and were actively connected with important business enterprise, with every prospect of a long and successful career. All are possessed of vigor of mind and body. Not one of them personally considers himself or any other individual or any interest that may appear before the board. They have no one in mind to favor or to punish. They are considerate and respectful, but they are obdurate when a claim is presented which seems to them to be unfair or unreasonable. They serve their country by their effort to be practical, discriminating, reasonable, just. And the assistants to this board, representing a diversity of talent and experience, are of great benefit to the board in the ascertainment of facts and the application of principles and comparisons. Some of them you know personally, and with the high qualifications of all of them most of you are acquainted.

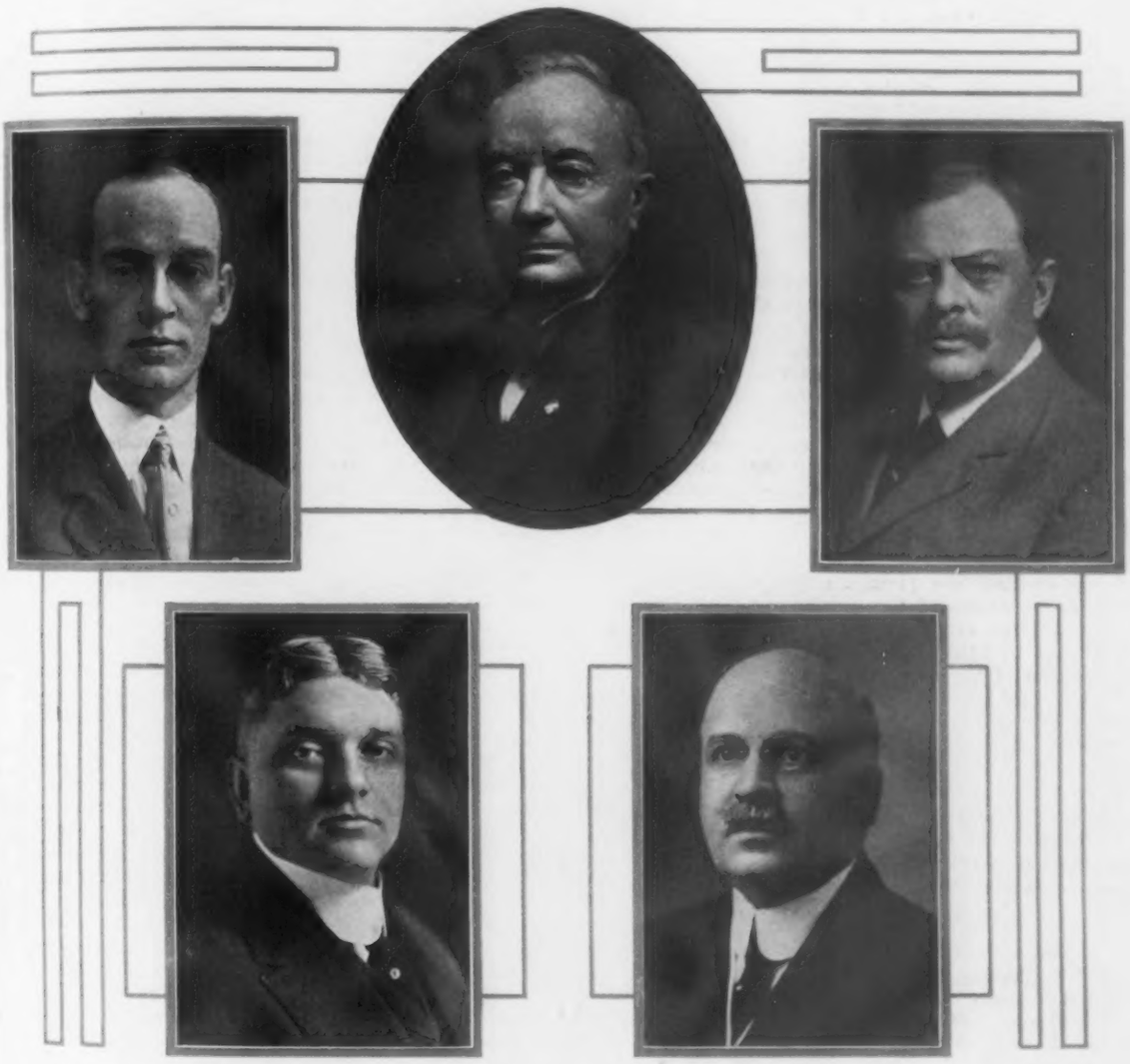
Present Duty

"Reference has been made to the general business organization of the Government and its membership for the purpose of suggesting to each of us present today our duty in this time of trouble and sadness; and to the character, disposition and qualifications of the members of the War Industries Board for the purpose of making prominent the inference that the steel committee could not, if it desired, secure from this board at any time a determination or recommendation to the President which was unreasonable; and that every one would be ashamed before such a body of men to urge any claim he did not believe to be sound and proper."

Judge Gary then proceeded to review the history of the war in Europe. Speaking of the plan of the

Prussian Germans to precipitate an international war so that Germany might dominate Continental Europe, Great Britain, United States and nearly all parts of the world, he said that it usually happens that the worst criminals make some fatal mistake in the execution of malignant plans, however carefully studied, and Germany made two great mistakes at the outset. She believed that she could enter Belgium and France without interruption and was mistaken, and she also was in error in assuming that she could violate her solemn treaty with Belgium without offending the sense of honor and decency of the entire neutral world. In conclusion Judge Gary said:

"If the members of the Iron and Steel Institute agree with what has been said thus far, as from a long and intimate acquaintanceship I believe they do, then it is easy to determine and to follow the lines of duty. We occupy a position of the highest importance in the present war. Our country and its allies in the international conflict are in need of every pound of steel which can be produced in this country, and which can be used for war purposes. To insure this supply every furnace and mill having relation to the subject must, without interruption, produce to the fullest capacity and subject to the control of the Government through its lawfully constituted agencies. No excuse for neglect, delay or interruption will or can be accepted by the Government. The Administration desires and intends to pay fair and reasonable compensation, sufficient to maintain existing wage rates, salaries of officials and extensions necessary for war purposes. Up to the present time we have no reason to complain of the attitude and action of the Government, although we have been disappointed in some respects. It is up to us to prove our continued loyalty to the Government; but more than that, our loyalty to ourselves in the performance of duty. Even though there should be dissatisfaction concerning prices or the details relating to production or distribution of tonnage, still production and deliveries must continue without interruption or diminution, leaving any question at issue to be settled at a later date. So long as the attitude of those in control of Governmental affairs toward producers remains as it is at present, it must be the effort, as it will be the pleasure, of every one of the latter to do his part unselfishly, wholeheartedly and assiduously.



W. VERNON PHILLIPS JOS. G. BUTLER, JR. D. B. MEACHAM
EUGENE P. THOMAS ENRIQUE TOUCEDA

SOME OF THE PARTICIPANTS IN THE MEETING OF THE AMERICAN IRON AND STEEL INSTITUTE AT CINCINNATI

If Defeat Should Come

"If our country is defeated in the pending military conflict, your property and business and mine will be of little value. We will have retraced our national steps a century and a half. The wealth of the country would be seized and retained as prize money by other nations. We have been forced into the war and we are compelled to fight in defense of our persons, our property and our sacred honor. There is no escape. We are in the war to the end, however costly and bitter. No man, no country was ever engaged in a more righteous

or a more compulsory defense. If we do not do everything practicable to uphold the hands of the President and to add to the success of the defense against the foreign aggressor, we are less than men; we are weaklings; we are poltroons. I believed for a long time we could and would be kept out of the war, but there was no escape. It was forced upon us. The President delayed as long as he consistently could. We must now fight with every weapon within our reach. We must liberally subscribe to the Liberty Loans. We must cheerfully pay our taxes, and, of still greater importance, we must furnish steel in larger and still larger quantities. If we succeed in this war; if we do our duty, life here will be worth living. Our country will occupy a place in the front rank of worthy nations. Democracy in its truest sense—one that means 'a whole people, unified, with one law for rich and poor, equal opportunities for all men'—will be firmly established. A basis for preventing future prolonged wars will be secured. Our properties, our businesses will be more valuable than ever. Progress and prosperity will be in evidence on every hand. The war will have been a real, substantial benefit to the entire world. The moral strength and power of this country and other similar countries will be greater than ever before. If we believe the Allies can and will win the war, then we may be pronounced optimists for the long future.

"On the battlefields of Europe men are dying by thousands and tens of thousands. Our sons or brothers or other relatives will soon be active participants. I fear the rolls of the dead or injured may be brought across the ocean within a few months, although I hope for the contrary. These men who have cheerfully offered their persons as a sacrifice to a noble cause are appealing to us by thought, if not by word, for such assistance as we may render. Every dollar we expend, everything we do, every sacrifice we make will assist in protecting the patriots who are abroad in defense of our rights. We must not, we cannot, withhold anything that will be of benefit to those splendid men."

Great Merchant Marine Without Subsidy

Earnest Plea for American Ships by President Thomas, Who Discusses Important Effects of the War on Export Business

Eugene P. Thomas, president of the United States Steel Products Co., New York, read a paper on "The Export Trade as Affected by the War." He was listened to most attentively and was heartily congratulated by many on account of the very forceful and clear manner in which he discussed his subject.

In beginning, he said that foreign trade, instead of being merely a contributing factor, has become an indispensable element of our industrial prosperity. He referred to a very important part that metallurgy has played in provoking and prolonging the present conflict. Then he said: "When the Germans seized and, in spite of the Allied victory on the Marne, held the Briey basin, they expected the prompt collapse of France. For this basin contained nine-tenths of all the French deposits of iron ore, and of 127 blast furnaces in active operation in 1913, 95 were in the war zone and in the possession of the enemy. Thanks to the British navy, France still possessed the freedom of the seas, and from England and the United States were poured in supplies of munitions of war pending the utilization of unworked deposits of inferior ore outside of Lorraine. A new equilibrium between supply and demand was finally established, but it is no exaggeration to say that for months the very existence of France hung on her supplies of steel. So also, for that matter, did the victorious advance of Germany."

Capacity in Germany Increased

Representatives of six important industries, addressing the Chancellor on May 20, 1915, assured him that if their production of iron and steel had not been doubled since the preceding August it would have been impossible to continue the war, and dwelt upon the great value of the iron-ore deposits of Lorraine.

As to present and future producing capacity of the world, Mr. Thomas said: "Stimulated by the demand created by the war, the productive capacity of this country has been enormously increased. The same thing has occurred, although not to so great an extent, in Great Britain, Canada and France, while new iron and steel industries have been created or expanded in other countries, as in Australia, India, China and Japan. After the war, we shall find ourselves probably with an annual capacity of 35,000,000 to 40,000,000 tons of finished steel, and if the domestic consumption is not greater than its maximum in the past, it will leave probably 8,000,000 to 12,000,000 tons to find export markets; in other words, from 30 per cent to 100 per cent more than the present abnormal steel exports, which are largely for war requirements.

"England, with 8,000,000 tons before the war, will have 12,000,000 tons after it is over. The productive capacity of France and Germany must largely depend on the future of Lorraine and its ore deposits, as well as of the coal in the valley of the Sarre. The coal mines were acquired by Germany in 1815 and the iron mines in 1871. In the event of the retrocession of both to France, her annual production of iron ore would be raised to 43,000,000 tons, while that of Germany would be reduced to 8,000,000. In addition, France would have a new annual production of 16,000,000 tons of coal—an important addition to her capacity to develop her own iron and steel industries, instead of feeding those of Germany.

"Whatever the distribution of the European ore supply, it may be confidently asserted that our capacity after the war will represent nearly, if not quite, as much as that of all other steel-producing countries combined. We shall thus be as urgently in need of foreign markets for our products as the Germans ever were."

Post-Bellum Demand

Continuing, Mr. Thomas said that there is no reason to fear the post-bellum "glut" of steel which some pessimistic observers have prophesied, at least during the first few years after the advent of peace.

"The destruction which has followed in the track of war has been so thorough and widespread," said Mr. Thomas, "the depletion of existing stocks so complete and the suspension of antecedent enterprises so much the rule, as to preclude any doubt about the steel-making capacities of the world, during the period of rehabilitation, being fully employed. In addition to all this, the regeneration of the shipbuilding industry in this country will continue to provide a tremendous outlet for steel, and the coming demand for structural shapes may be partially gaged from the fact that building statistics show that new construction has been greatly curtailed as a result of the war requirements. The same statement applies to Europe as a whole no less than to the more progressive sections of other continents, and there can be little question that after the war the demand for steel will be sufficient to keep the industry on a stable basis for a considerable period.

Under New Conditions

"As for the prospects of the more distant future, there is one point which cannot be too strongly insisted on, because it is frequently lost sight of, and that is the incalculable influence of the material development of the world of conditions of peace under which it will have been made safe for, and there will be equal opportunity for commerce and industrial enterprise. Take the one item of railroad construction, which in two great continents—Asia and Africa—has been heretofore dominated not by commercial, but by political, considerations. After the peace, which we are all agreed in assuming will not be a German peace, no cloud will rest on the international status of such an enterprise as the Bagdad Railway. It will be one of the chief links in the great chain of overland routes be-

tween Europe and Asia, stripped of all the perils to the world's peace that inhere in so-called "peaceful penetration." Its operation, as a purely business undertaking, will promote the construction of a network of railways in Persia; it will be linked with the India system on the one side and the completed Cape to Cairo line on the other. It will be part of a great international highway that will draw closer the bonds between three continents and will cut in two the time consumed in traveling from Europe to Australia.

"And this is but one of the great world enterprises to which a secure peace among nations, divested aqually of the power and the desire to make war on each other, will bring a stimulus and support hitherto unattainable. It should be safe to predict that the 10 years succeeding the conclusion of peace will be such an era of railroad construction as the world has not seen. And where the railroads go, into lands old and new, there will be created a demand for the utmost volume of manufactures in the service of an improved agriculture, of irrigation, of mining, of the utilization of water power and of the processes of an expanded and diversified industry. No 'glut' of steel should be apprehended in the saner, soberer and chastened world which will emerge from the stern ordeal of the awful struggle by which it is now convulsed, because what we call the process of reconstruction will simply be the beginning of an unexampled development of the productive energy of the newly enfranchised nations.

Must Work Toward Common End

"But it should be recognized that our share of this process will be small or great in proportion as we are able to co-ordinate our vast and varied productiveness to a common end. The necessity of balancing imports and stabilizing exchange; the creation of an American merchant marine; the necessity of compensating the output of additional capacity by increase of exports, and the advisability of meeting the combination of our competitors in foreign markets by the use of similar weapons, would seem to be among the rudimentary requirements of the situation. It is manifestly of the greatest importance, for example, that we maintain imports of necessities, such as manganese ore from Brazil, nitrates from the west coast of South America, pig tin from the Straits, wool, coffee, rubber and other commodities. These extensive and valuable imports must be balanced somehow, either by the maintenance of an export trade with these countries or in the familiar triangular fashion of equalizing them by exports to other countries which make the required payments to our creditors in goods of their own.

"All of the European countries now at war will be under the most urgent necessity of exporting their products to the greatest possible extent as a means of rehabilitating exchange and of paying for needed imports. We may expect, as a consequence of the experience gained during the war, that the manufacturing nations of Europe will have learned the absolute necessity of organization, co-ordination and co-operation. If we are to meet them in foreign markets on terms of equality, it will be necessary not only that we establish methods of mutual co-operation, but that our Government aid and protect us at least as effectively as our competitors will be aided and protected by their respective governments.

A Lesson Learned

"Our country has had to pay dearly for our abject submission to the decay of our merchant shipping in foreign trade. But the lesson has been learned, and with it has come a recognition of these fundamental principles: We must be enabled to freight our products to foreign markets at a cost not exceeding that which will be available to our competitors, and this will be possible only if we have an American merchant marine unhampered by restrictions from which our chief competitors are free. The British shipping industry which for generations has been and is still by far the greatest in the world was built up by the exertions of the men engaged in it. It prospered because it was free from restrictions to which its competitors were subject. Theories to the contrary notwithstanding, we cannot have, in time of peace, an American merchant marine worthy of the name unless it be profitable to operate it without subsidy or subvention. This is manifestly not possible upon any practical or permanent basis so long as it costs more to operate an American steamer in ocean-going commerce than a foreign steamer in the same trade. Unsubsidized steamers have always been able to make a better showing for their owners than the subsidized ones, and it is certain that while a large majority of the British lines have received no subsidies from their Government, they have nevertheless grown and prospered and have found no difficulty in competing with the subsidized lines. I repeat that what is necessary for the future growth and success of the American merchant marine is that it be placed upon a footing of equality with its chief competitors; with a fair field and no favor, repealing all laws which experience has shown to be detrimental to its growth, thereby leaving American enterprise free to achieve a success equal to that which the British shipping industry, unhampered by restrictive laws, has been able to accomplish.

The Steel Industry's Efficiency

"The present plans of the United States Shipping Board, involving the building of millions of tons of ocean-going steamers, are not of greater consequence to the future of the export and import trade of the United States than they are to the maintenance of the steel industry on that high plane of efficiency and maximum output which it has reached during the past year. There has been afforded through the unexpected exigencies of this war a hitherto undreamt of opportunity for Governmental assistance in the upbuilding of a great merchant marine, as well as a striking illustration of the means by which American manufacturers can co-operate under Government sanction and supervision for the supply of materials in enormous quantities. Idealized by the patriotism and loyalty which it has exemplified, we have had a close affiliation between the Government and the great industrial activities of the country, the value of which in solving the special problems of the present is of good augury for the service it may render in meeting the demands of the future."

Wonderful Development of the Iron Business

Joseph G. Butler, Jr., Tells of the Marvelous Progress Which He Has Witnessed—The Biggest Thing Kaiser William Overlooked

In his paper on "Fifty Years of Iron and Steel," Joseph G. Butler Jr., of Youngstown, Ohio, said in part: "In honoring me with a place on your program the committee evidently regarded half a century as long enough for any man to be actively engaged in the iron and steel industries. As a matter of fact, my experience in them covers a period of 60 years, for I became shipping clerk and assistant manager at the iron rolling mill of James Ward & Co., Niles, Ohio, in 1857, after having spent three years as a clerk in the store connected with that enterprise, during which time I added to my accomplishments the musical art of speaking Welsh and also acquired the ambition to become an ironmaster.

"These 60 years cover the greatest progress the world has ever known. They have brought forth so many startling discoveries, so many striking inventions, so many achievements, enriching and broadening human life, that merely to mention all of these would be a tedious task. Most of these were the work of American genius. They are the fruits of individual liberty and just reward for individual effort first known to the world after our forefathers had established freedom in enduring form upon this continent. The mere

contemplation of this progress should serve to remind us of our obligations at this time, when civilization is turning the sharpest corner in its history, and when the right of men to self-government and self-development is threatened as it has never been threatened before.

In Early Days

"Sixty years ago, there was no such thing as the steel business in America. The trifling production of 'blister' steel, amounting to about 2000 tons per year, was not worthy of that designation. But the iron business had already laid the foundations of its future greatness. And this in spite of the fact that we had then comparatively no ore, no efficient fuel, no adequate machinery and very little of the practical and scientific knowledge so widely diffused to-day.

"When I entered the iron business we made iron without coke, a task resembling that of the Hebrews who were compelled to make bricks without straw. We had what would now be considered no ore, for the chief supply was derived from an occasional pocket in the hills or gathered from swamps or the beds of creeks. We had no furnace tops, no blast stoves, no hot blast as we know it now, no metallurgists, and, in the light of the present experience, no markets. We knew nothing of the value of gas, natural or manufactured, a fuel indispensable in the manufacture of iron and steel in large quantities. But we did have grit and energy—the determination to do our best, and the same pride in doing things that we have now.

"There were some compensations, of course. The payrolls were not so large and we were not troubled with a shortage of cars to move our product. I recently came across a statement issued by the superintendent of the Ward furnace, operated under lease at Youngstown, about the time of my entrance into the business. It said: 'Our next payroll will amount to something like $200. We ought to have at least $20 in cash.' The payroll referred to was for one month. The cash was needed to give some of the men a little money for some special purpose. As a rule, they were paid in store goods. Among some other furnace records of these days I have seen an entry reading: 'Paid James Dobson $6 to git married.' At some of the furnaces in that locality, it was the custom to give the men a dollar in cash at Christmas and the Fourth of July. At other times, they got along without any money. From all of which it will be seen that many things, among them getting married and running a blast furnace, were done with less capital than at the present time.

"There was at that time no thought of making steel at the ordinary iron works. The equipment consisted of one or more small heating furnaces, one or two trains of rolls, perhaps a forge fire or two, a few puddling furnaces and occasionally some machinery for making cut nails. The product was usually either simply pig iron, or merchant bars, a commodity which, by the way, has not changed its name in the whole 250 years since iron was first formed by forging into that shape.

The Bessemer Process

"The steel business was really born in America when the Bessemer process came into use here, which was not until about 1864. The idea of removing carbon and silicon from blast-furnace iron in this way was undoubtedly first conceived by an American, although he failed to develop the machinery for its use, and, as a consequence, reaped very little benefit from it. When William Kelly, who first decarburized iron by means of an air blast in a furnace he had erected for that purpose at Eddyville, Ky., about 1850, came to file his claim for a patent in 1856 he found that Henry Bessemer had filed similar claims and been granted patents a few days previously. Kelly had worked for years on his scheme, which was identical in principle, but he had not yet made it a commercial success and did not attempt to make steel in that manner. Nevertheless, his use of the pneumatic process first was not disputed and he was granted an interference as against the Bessemer patent.

"I recall distinctly a visit made by this man to Niles while I was a member of the Ward family, being employed in the Ward store, about 1854. He came there to enlist the interest of James Ward, then regarded as an authority on the iron question, in behalf of his experiments, and was a guest at the Ward table on several occasions. How far he succeeded in his errand may be judged by the fact that Mr. Ward said after he left that he was crazy.

"The invention of the Bessemer process, or rather its perfection and development, is generally regarded as the longest single step in the march of progress that has brought the iron and steel industries to their present stage, but there are other discoveries that seem to me even more important. We cannot make steel without iron, and therefore of even more moment than this invention were such things as the discovery of the Lake Superior ore ranges, the invention of the furnace top, the use of coke and its economical manufacture, the development of high blast temperatures, and, especially in view of its recent rapid adoption, the Siemens-Martin open-hearth furnace.

Kelly's Troubles

"As has been stated, I met Mr. Kelly when he was trying to make his great discovery a practical success. I saw him on a number of occasions later, when he was working to unravel the skein of litigation that tied up the Bessemer process and prevented its adoption in this country until ten years after it was patented here. I can recall the announcement in the technical journals of that day of the discovery by Robert Mushet, a Scotsman, that speigeleisen would recarburize iron blown in a converter and thus produce steel. We did not know of this in America for some time after Mushet's patents were granted in England, which was in the latter part of 1856. Up to that time, Kelly did not suspect that he had found a new way to make steel, and had urged his process on iron manufacturers only as a cheap and rapid method of purifying iron for rolling mills, claiming that it would take the place of puddling, something it has, by the way, never done.

The Hot Blast

"Likewise I was privileged to watch every step in the development of the hot blast. At the Ward furnace at Niles, and in other furnaces in the Valley, the blast was heated by passing it through cast-iron pipes, and these lasted but a short time, their renewal and replacement keeping the local foundries busy and interfering seriously with continuous operation. We had what we called a hot blast, but it was really only warm in comparison with modern practice. The furnacemen tested its temperature with lead and zinc, strips of which were inserted at the point where it entered the furnace. If the blast melted lead it was not quite hot enough, and if it melted zinc, it was too hot, so we believed, and would burn the iron. Between the melting point of lead and zinc, as we now know, there is a very considerable difference, so that our wind varied about as much in temperature as it did in pressure. If you reflect that the blast in those days was blown usually by an engine that had been worn out on a Mississippi River steamboat, and that it was a usual thing for the men about a furnace to operate the walking beam when the engine broke down, you will have some light on the strength and steadiness of the hot blast of that day.

"It was about 1868 that the Player hot blast stove was brought from England to this country. It was a decided improvement. This stove introduced an innovation in being located on the ground instead of at the tunnel-head. The first stove to employ the regenerative principle was the Whitwell stove, and it was lined with fire-brick, also a new idea. Both it and the Player stoves immediately increased the output of furnaces and made larger stacks possible, although it was many years before they supplanted the old Thomas stoves at many American furnaces.

Credit to the Germans

"The use of furnace gas for heating the blast in this country we owe to the Germans, the first effort to bring these gases down and burn them under stoves and boilers in America having been made by C. E. Detmold, a German engineer residing in New York, about 1859. The new plan cost a good deal of money and was slowly adopted for that reason. We did not get to it in Ohio

for some years after it was used in the East. I recall very distinctly the first furnace top installed at Youngstown. It was thought highly dangerous by the workmen, and there was at first some difficulty in getting them to work around the stack.

"With the use of better stoves and the introduction of more powerful blowing engines, furnaces began to grow in size and more attention was paid to their lines. It was realized that much improvement could be made in the output, and progress in this direction was rapid. By 1875 it was known that blast furnaces could be operated successfully up to 80 feet in height, and, with coke for fuel and proper equipment for blowing and heating the blast, could be made to yield much larger product than had been expected up to that time. But it was not until about 1880 that one of these larger furnaces reached an output much above 100 tons per day. This was the Isabella, located at Etna, near Pittsburgh. During three years, 1881, 1882, 1883, this furnace produced an average of 1090 tons per week—the best ever done by a blast furnace up to that time in this or any other country.

The Old Stacks

"To those who have had experience only with the present day blast furnace and modern furnace practice, it is impossible to portray the conditions surrounding this industry at the time when I first became interested in it. The old stack of those days, with its equipment, would be picturesque in the extreme if it could be set up in the vicinity of a modern steel works. The stack was usually about 35 feet in height and built of masonry, lined on the inside with a poor quality of fire-brick. It was square in section on the outside, the bottom being about 24 feet each way and the top somewhat smaller, this depending on the opinion of the man who designed it. The stack was usually located against a bluff, the double purpose being to make construction cheaper by using the hill to reinforce one side and enable a patient mule to perform the functions of a skip hoist by dragging the ore to the top of the hill. A short bridge connected the stockhouse with the top and the material charged was wheeled from this point and dumped in at the open top.

"Only one or two tuyeres were used, and these were often on the same side of the stack, next to the blowing engine. In front was the sand bed, into which the iron was run, and to one side the space reserved for roasting the ores. No water-cooling devices were used except at the tuyeres and the opening in front. It was a very small proposition compared with what we are used to at this time, but was, nevertheless, a source of general public interest and regarded with considerable awe by the uninitiated. I can recall the first furnace in our district whose builders had nerve to locate it away from a hill. They used a hoisting device in which a tank filled with water raised the platform on which two wheelbarrows loaded with ore had been placed. When the barrows were dumped, they were wheeled back on the platform, the water was let out of the tank at the other end of the rope and they came down to be refilled.

Crude Engines

"The blowing engines were of the crudest type and had but little power. There was then no method of gaging the pressure accurately and this was one of the cares of the furnace boss. He was expected also to know when the furnace was ready to cast, the proper color of the iron, and a great many other things. As a rule, he did know these things better than might be expected, and these old furnaces made good iron even if they did not make much of it.

"Even this type of furnace was a great improvement over those in use forty years earlier in that locality, for these used the 'trompe' or water blast, which was, you may be sure, somewhat removed from the Gayley dry blast. This was a contrivance by which a waterfall was made to carry air into a box, compressing it in the top, from which it was carried to the furnace through a small pipe.

"It is a curious circumstance that the first furnace erected by the Carnegie Steel Co. was one torn down at Escanaba and taken to Pittsburgh. It had been erected in Michigan to be near the ore fields, but its owners found that the problems of transportation could not be solved in that way alone.

First Use of Coke

"About 1860 the first coke was regularly used as fuel in a furnace at Pittsburgh, and within a few years it proved so efficient that all other fuels were practically eliminated except for making special grades of iron. Owing to the advantage of this natural fuel, known as 'Brier Hill' coal, we did not begin the use of coke in furnaces at Youngstown until 1869, at which time the coal began to grow scarce."

The employment of coke as a blast-furnace fuel was considered at some length by Mr. Butler, who next gave a brief history of the Lake Superior iron-ore region and the development of ore mining and handling.

"When we began to use Lake Superior ores the ordinary cargo of a lake boat was 500 tons," he said. "It required several days to load and unload this cargo at every point where it had to be handled—four in all. The ore cars then in use carried only ten tons. When their capacity was increased to 25 tons and boats were built that would carry 1000 tons, we thought our problems were solved. Now we have vessels loading as high as 12,000 tons at the upper ports in two or three hours with one or two men on the dock, and unloading their cargo directly into 50-ton cars in about the same time—and with practically no manual labor.

Mill Development

"No less remarkable are the changes that 60 years have witnessed in the fabrication of iron and steel. When I first entered the business the plant of my employer consisted of a small blast furnace, a refinery forge or two and a mill upon which we rolled iron bars for various purposes. After the pig iron had been refined in the furnace, a process somewhat like that of puddling, it was rolled into muck bar. This was then made up into bundles, reheated and rolled on a primitive form of bar mill. My first contribution to the efficiency of the plant was a plan to regulate the size of these bundles so that they would produce a bar of the size and length desired and thus eliminate excessive waste from scrap as each piece was rolled. It was recognized as a discovery and Mr. Ward complimented me highly.

The First Bar Iron

"The first bar iron was rolled in New England about 1825, and the first puddling in this country was done in 1835, both at the Boston Iron Works. The first successful American blast furnace of which there is a reliable record was built in the Ramapo Mountains in 1800, or a short time prior to that date.

"The first successful iron-working plant was on the Hudson, at Cornwall, where some Cornish iron workers gathered soon after the middle of the eighteenth century. It was a simple bloomary and forge. In 1780 a forge at West Point, doubtless an outgrowth of the establishment at Storm King Mountain, produced a great chain which was stretched across the Hudson to prevent the British gunboats from passing up that stream. That chain still holds the honor of being the largest ever forged, a fact which shows that our ancestors could rise to great efforts when inspired by patriotism, even as we are doing to-day.

"I occasionally go into the blooming mills at the Brier Hill plant, where we break down a steel ingot in less than a minute and mentally compare the massive machinery in use in modern steel plants with the equipment of those days. Still, we had achieved a good deal even then. The first successful rolling mill in this country was about as primitive, compared with the equipment of 60 years ago, as was the old Ward mill when compared with a modern rolling mill.

"The pioneers started with nothing. We had at least something to work with. Both they and we of this generation have made the best of our opportunities, and the result is the majestic industry which to-day stands without a rival in the efficiency of its processes, in the zeal of its operatives and in its far-reaching effect on human happiness and welfare.

"Much of this great progress has been undoubtedly due to the men who have been engaged in the iron and

steel business. In justice they must be given credit with a degree of enterprise found in no other industry. They have been willing at all times to face ruin for the sake of adventure into new and more promising fields. They have rewarded courage, vision and genius as no other industry has rewarded these things. They have constantly looked forward to higher achievements, scorning the contentment that sometimes brings stagnation to a great industry.

"All of this progress, however, cannot be credited to the men of the industry. Some of it was undoubtedly due to the greatness of the country, the magnificence of our natural resources and the enterprise of our people as a whole. In no other country in the world, for instance, could there have been a demand for railroad expansion such as to require 500,000 miles of steel rails in less than 30 years, as was the case in this country between 1865 and 1895.

"To one who can recall the early years of iron and steel manufacture there is nothing more inspiring than the ceaseless effort of men engaged in the industry to find better and more economical methods of producing iron and steel. To this must be ascribed in large part the phenomenal advances made in America, which has led the world in the perfection of metallurgical processes and the adaptation of mechanical appliances for these purposes.

The Protective Tariff

"In like manner there is no question that a part of the development was due to the tariff policy which for a great portion of this period encouraged enterprise by protecting the struggling iron and steel industries against competition from abroad and assuring reward for energy and ability expended in this direction.

"You will pardon me if I claim some small part in this, for it was my privilege to be consulted freely by President McKinley during the period in which he labored so faithfully and effectively for wise tariff legislation, as well as to enjoy his personal friendship and confidence during his lifetime. One of the most gratifying tasks of my life has been the effort to repay in some small measure the debt owed by the industries of America to this statesman, whose broad vision had so much to do with our national growth, by conceiving, planning and, with the help of my friends in these industries, erecting to his memory at Niles, Ohio, on the spot where he was born and where we played together as boys, one of the noblest and most beautiful memorials on the American continent. This structure was dedicated on Oct. 5, 1917, and I hope you will permit me at this time, although it may seem foreign to my subject, to extend to every member of the Institute an invitation to visit it. It has cost approximately half a million dollars and is artistically worthy of its purpose.

"I have had the honor to be consulted by the men who framed every tariff bill passed by a Republican Congress since 1875, and have endeavored to consult the framers of every Democratic tariff bill during the same period.

Great Associations

"Still more helpful was the influence of the organizations created and fostered by men of vision in the two industries. These men saw long before it came to be generally realized that the true basis of success in manufacturing enterprises was not so much unreasoning competition as sensible co-operation, and they early put their views into effect by the organization of such associations as the American Pig Iron Association and the Bessemer Pig Iron Association, both of which it was my privilege for many years to serve as president; the American Iron and Steel Association and our own great association, the American Iron and Steel Institute. It would be hard for anyone to estimate what has been accomplished by these organizations toward the stimulation of progress and the conservation of resources in these two lines.

"Even those least friendly to the iron and steel interests must acknowledge that they have led all others in this country in matter of advanced ideas along sociological lines. This has been practically true of the American Iron and Steel Institute, under the able administration of Judge Gary. We have been the first to realize the great truth that business success depends upon co-operation rather than upon competition, a truth now generally admitted. We have been the most generous of all the industries in dividing with labor the rewards of business. We have led all other industries in the matter of safety, sanitation and welfare work, and we have done more than any others to establish in the public mind the fact that the interests of labor and capital are identical, the prosperity of one involving the prosperity of the other, and both owing to the public duties equal to those they owe to themselves.

"It has been my privilege to enjoy the personal acquaintance and friendship of almost every man who has been prominent in the industry in this country, as well as many of those who have achieved fame abroad. Among these are many who have closed long and honorable careers, and many who are still in the heyday of their usefulness. But even more gratifying to me is the fact that in my experience it has been my pleasure to have in a certain sense been tutor and friend to many young men who have since proved their ability and energy by reaching positions of high usefulness and reputation.

"It has been said that 'Youth longs, manhood strives and age remembers,' and this is my excuse for indulging in reminiscences before a body of busy men intensely interested in the present and future. To me it seems that this future can be gaged accurately from the present and the past. The early days of iron making in this country are radiant with the spirit of progress and of patriotism. This spirit had no small part in making America monarch of all the forges, and it has not died out. We can depend on it to still preserve the wonderful lead we have attained in production, and to maintain the institutions to which we owe so much of all that is good for us and for the world.

America the Leader

"It is as true to-day as it ever was that the civilization of a people may be told by their progress in the use of iron and steel, and I hope the time will never come when America will no longer lead all other nations in this respect. I hope also that the time will never come when men in our industry will show less public spirit or less patriotism than in the past. In the present crisis of our national life, we need the high purpose and the unselfish devotion to country that our members have shown. We need the courage and vision of Judge Gary, our president, and we need the energy and ability of our younger manufacturers as never before.

"In 1916 I spent six weeks in France and England with the American Industrial Commission. Had not what I saw there been sufficient to impress upon me the importance of the American iron and steel industries in the world's struggle against despotism and scientific barbarism, the statements made to me by the leaders of the French and English people would have done so. Without the magnificent resources of our mines and mills, the Allied cause would have been lost long ago. The genius, the energy and the rectitude of purpose that made possible the splendid industrial development of America have also made possible the preservation of democracy. There can be no doubt whatever on this point. Our Government was not ready, but our mills were prepared. The biggest thing the Kaiser overlooked in his calculations was the American iron and steel industry.

History's Supreme Hour

"It has been our great privilege, gentlemen of the Institute, to render aid on behalf of the world in the supreme hour of history. We are now called upon to make sacrifices in the same great cause recently brought more directly home to America, but scarcely more ours now than it was at the beginning of the war. That we shall do so with energy and devotion characteristic of our history and in keeping with our traditions, I have not the slightest doubt.

"Aside from this duty to aid our country in every way possible by the efficient operation of our properties and the ready co-operation with the Government already shown, our chief duty, as I see it, is to preserve

the traditions and continue the splendid record of the industries in our care. There is still much to be done. The limit of advancement has not been reached. In the future lies opportunity as great as that of the past. It must be grasped by younger men, for we older ones have reached the summit from which the view most alluring lies behind us. If the facts and reminiscences to which you have so patiently listened to-day give you inspiration to carry out the traditions and emulate the performance of the great industries in which you are fortunate to be engaged, they will have achieved their purpose and I shall have my reward."

Substitution of Electric Power for Steam Necessary

Samuel S. Wales Gives Valuable Facts About Costs and Other Features of Modern Electric Motors in Steel Mills

S. S. WALES

In his paper on "Modern Electric Motors in Steel Mills" Samuel S. Wales, electrical engineer, Carnegie Steel Company, Pittsburgh, said in part:

"The electric motor has been applied to every class of machinery used in the production and finishing of steel, although only very recently has any one plant used electric power throughout. At the blast furnace, electric power is now almost exclusively used in new construction, and is replacing steam and hydraulic power in existing plants, wherever the changes required are not so radical as to make the first cost prohibitive. The automatic skip hoist, the ore bridge and transfer cars are all so familiar as to need no description. In the steel producing departments, cranes, charging machines, transfer cars, etc., are too common to attract notice, though some of the later applications, where the electric motor has replaced the hydraulic cylinder, such as ingot stripping, lifting furnace doors and tipping metal mixers and tilting furnaces, may still be of interest.

"It is in the rolling mill, however, where the ruling spirit is mechanical power rather than metallurgical reactions, that the electric developments have naturally been most spectacular. From the early beginnings on cranes and charging machines, the motor now drives everything, including the screw-downs and manipulator, applications which were long and stubbornly contested by the steam engine and the hydraulic cylinder. One of the later achievements of the electric motor is the direct operation of a large billet shear, abandoning the use of the usual heavy flywheel and clutch, and starting the motor from rest for each cut. This shear has a maximum stroke of 8 in. and the entire apparatus reaches full speed while the shear knife is traveling ¾ of an inch.

Main Mill Drives

"Having become successfully established for all the detail operations in the steel mill, the next natural step was to the main mill drive, which had always been the ultimate goal of both the mill electrical engineer and the manufacturer of electrical equipment. While the same flexibility and lack of reciprocating parts recommended it, several engineering drawbacks retarded the development for large units fully as much as the first cost of the motor itself.

"The main mill drive motor is automatically divided into several types, by the class of mill to be operated such as constant speed non-reversing mills for plates, billets, structural shapes, etc., where the product is sufficiently uniform to have one most efficient running speed; variable speed non-reversing mills, for wide ranges of products, such as merchant bar mills; and reversing mills, for blooms, slabs and universal plates. The straight a.c. induction motor is recommended by common consent by all the large manufacturing companies for the non-reversing constant speed mills, and as the simplest machine that will accomplish a given end is always the best, there is no criticism to be made on this choice.

"For the variable speed non-reversing mills, there is considerable divergence as to the method of producing the changes in speed, i.e., the Kraemer system, in which the regulating apparatus is mechanically connected to and at times supplying part of the mechanical torque to the rolls, by means of the regulating current, and which can be designed to operate either above or below, but not at synchronous speed, and the Sherbius system, in which the regulating apparatus is mechanically separated from the main motor, returning its surplus power to the line, and which can be run at any point below, through and above synchronous speed. For many mills where only small ranges of speed change are required, either of the above systems should be equally satisfactory, though it would seem preferable to do all the driving with one motor rather than supply 5 per cent or 10 per cent of the mechanical power through the shaft of the regulating motor, as is the practice in the Kraemer system. Where wide ranges of speed are called for and the motor may be required to operate at or near synchronous speed, the Sherbius system would appear to be the most adaptable, for with the Kraemer system there will always be a region varying from 2 per cent to 5 per cent on each side of synchronism where the motor is unstable.

"For the reversing mill, all are agreed on the flywheel motor generator set (the Ilinger system), but some difference of opinion is still apparent as to the main motor, whether compound or shunt wound. It is somewhat difficult to reason out the advantage of the compound winding on a motor for this service. It appears doubtful if there is sufficient time when the ingot enters the rolls, and the shock is thrown back on the motor, for the compounding current to overcome the reluctance of the magnetic circuit of the machine so as to have any appreciable effect in cushioning the shock. It is quite apparent, however, that in later passes, after the piece is well in the rolls, and the motor is called upon for power and speed, the compounding will come into full action with a consequent decrease in speed and a reduction in the tonnage output of the mill.

"It must, of course, be thoroughly understood that this compound winding is entirely independent of the inter poles and the main pole-face windings, which are universally used by builders of large reversing motors for securing sparkless commutation by controlling the distribution and density of the magnet field of the motor.

"On all auxiliary mill motors, modern practice is to guarantee a maximum temperature rise of 35 or 40 deg. C. for a continuous full-load run, and it would seem that if such a standard is considered a necessary basis of safety after twenty years of mill electrical engineering, we should not abandon all precedent for a manufacturer's performance guarantee, which must be more or less intangible and cannot be measured. The best and most faithfully kept manufacturer's guar-

(*Continued on page 1105*)

STEEL HEATING ECONOMIES

Smokeless Furnace Operations and Fuels and Stokers—Heat-Balance Data

A DISCUSSION of smokeless operation of steel heating furnaces before the Engineers Society of Western Pennsylvania a few months ago involved the discussion of possible fuel economies as being closely associated with the question of smoke. Mechanical stokers, waste-gas washing, air infiltration for recombustion of waste gases, and gas-producer operation were some of the topics touched.

Furnace Practice

A. N. Diehl, assistant general superintendent, Duquesne Works, Carnegie Steel Co., Duquesne, Pa., opened the discussion. Artificial gas from coke ovens, blast furnaces or producers, as well as oil, tar and powdered coal, he said, have been proposed and are also being used for the purposes of reheating steel. Average soaking-pit practice, he estimated, will require for large ingots about 700 cu. ft. of natural gas per ton to maintain a temperature of 2400 deg. in the pits, or an equivalent of about 715,000 B.t.u. per ton. For secondary reheating, such as demanded in heating furnaces, for slabs, blooms and billets, approximately four or five times as much fuel is required to reheat cold material as is required for the preparation of the ingot from the hot open-hearth steel.

With ordinary product, he held, surface oxidization or scaling is not an essential detriment. Different plants show analyses from pits or heating furnaces, indicating a complete combustion of carbon without experiencing any excessive amount of scale. In some grades of steel, where the ingot surface is pitted, a long heating with a heavy slag has been found beneficial, as is the case in a number of nickel-alloy steels. In others, notably high carbon, heating must be carried on with the greatest care. This is also true of bars and blooms. A great amount of work has been done by engineers on the heating of steel of such form where there is very much surface exposed, as scale or pitting may ruin the surface or otherwise deteriorate the final product. The presence of carbon is generally advocated to prevent this and in consequence we have incomplete combustion.

H. C. Siebert, experimental engineer, Duquesne Works, Carnegie Steel Co., Duquesne, Pa., gave the following data from tests made in the past five years on different heating furnaces in the various plants of that company:

Heat Balances for Various Furnaces

Type of Furnace—Continuous

Kind of Fuel	Width of Furnace, Ft.	Length of Hearth, Ft.	Billet Section, In.	Length of Billet, Ft.	Weight of Billet, Lb.	Weight Heated per Hr., Lb.	Per Cent of Heat Absorbed by Steel	Per Cent Lost in Stack	CO Loss, Per Cent	Radiation Loss, Per Cent	Soot Loss, Per Cent	Carbon Lost in Ash, Per Cent	Total Heat in Fuel per Ton of Steel
Natural gas...	7	21.5	1½ × 1½	5	38.25	11,402	41.8	46.6	2.8	8.8	...	..	1,824,256
Natural gas...	8¾	34.0	4 × 4	3½	190.4	13,634	35.0	49.4	1.2	14.4	...	..	2,036,000
Natural gas...	8	32.0	4 × 4	2¾	148.6	9,340	20.3	45.9	3.2	30.6	...	..	4,072,000
Coal	8¾	37.5	3 × 6½	4	265.0	20,564	14.9	42.9	21.4	6.8	10.0	4.0	5,593,000
Coal	9	28.5	1½ × 1½	6	45.9	3,920	13.4	44.4	5.3	17.3	15.6	4.0	6,227,000
Natural gas...	9	26.5	4 × 4	3⅝	204.0	16,503	27.2	39.1	10.7	12.5	10.5	..	2,542,964
Natural gas...	9	26.5	4 × 4	3¾	204.0	16,891	40.0	47.3	...	12.7	...	..	2,009,532

Forty per cent, he said, is by no means the best efficiency on which furnaces are being operated to-day. Furnaces in his company's plant average month in and month out between 60 and 70 per cent, and are smokeless.

Washing Waste Gases

W. H. Smith, engineering department, Ford Motor Co., Detroit, stated that where new installations are made, or changes in old equipment will permit, sufficiently high chimneys should be provided, down draft used, and all waste gases drawn or forced through flues to washers or scrubbers, and delivered to the chimney free from obnoxious matter. This will mean that the incoming air delivered to many departments will be under a pressure, and that the outgoing air from furnaces is received in flues delivered through the washers to high chimneys or stacks. While such gas flues can be located overhead, what seems to be a better plan is to place them in underground tunnels or passageways. Such tunnels will also be the means and ways for help to go to and from their department divisions. In such tunnels will also be located power and water lines, and the conveyances for the supplying of departments, as well as coat-rooms and wash-rooms for the workmen.

Julian Kennedy, engineer, Pittsburgh, suggested that to do away entirely with the emission of smoke into the atmosphere, heating furnaces be connected to a common draft flue and the spent gases conducted either through waste heat boilers or direct to a scrubbing chamber and washed in the way Mr. Diehl has successfully used to clean his blast-furnace gases. This would be a simple process and would require much less water than is necessary where gases have to be brought to a low temperature to eliminate moisture so as to fit them for fuel.

Stoker-Fired Furnaces

Dr. J. S. Unger, manager, central research bureau, Carnegie Steel Co., Pittsburgh, objected to a mechanically-stoked, coal-fired pit or furnace as he believed a situation might arise in mill operations where it is necessary to shut off all the gas and rapidly reduce the temperature. A stoker used in connection with a steel furnace is full of burning fuel, which continues to give off heat for some time, even after the operation of the stoker is stopped. For ordinary mill temperatures for forging and rolling this is not so serious an objection as where stoker-fired furnaces are used for low temperatures between 400 and 850 deg. C., as in the heat treatment of steel.

Considerable experimental work, he said, is being done with heating furnaces fired by mechanical stokers. The newer types of such furnaces operate with very little smoke, as the knowledge gained in the study of highly efficient boiler firing without smoke has been applied in the construction of such furnaces. Underfeed stoker, forced-draft, coal-fired billet heating furnaces and stoker-fired continuous furnaces 70 ft. long and 20 ft. wide are, he claimed, being operated without smoke.

W. G. Graham, manager, Standard Steel Car Co., New Castle, Pa., stated that his company has five plate heating furnaces and two billet heating furnaces equipped with underfeed stokers all of which are practically smokeless. From the billet furnaces it obtains about three tons per hour. These furnaces are 26 ft. long by 7 ft. wide. The five plate furnaces average 15 ft. by 7 ft. hearth surface and are used for heating plates and shapes such as are required in car construction. He has never seen smoke from any stack of these seven furnaces more than five minutes at a time and that very rarely, say two or three times a day of 10 hr.

The billets heated are for 6-in. sheet forgings. A uniform temperature of 2300 deg. Fahr. is possible at all times and no trouble is experienced in meeting the physical test requirements which are: Tensile strength, 84,000 to 90,000 lb. per sq. in.; per cent elongation, 20 to 24, and reduction in area, 30 to 35 per cent. He does not believe this system of heating could be improved upon for the class of work mentioned.

J. R. Knopf, engineer, George J. Hagan Co., Pittsburgh, discussed the application of stokers to heating furnaces for bars or sheets in sheet and tin-plate mills. He knows of hundreds of sheet and pair and annealing furnaces being successfully heated by underfeed stokers. Many of these manufacturers report 25 to 30 per

cent fuel saving, and some as high as 50 per cent. They are also getting a better product. Their bars and sheets are free from oxide and pitting and there are fewer stickers and imperfect sheets than formerly.

The old idea that a smoky flame is necessary for the production of sheets is hardly worth considering in view of the fact that stoker-fired furnaces are operating with so little smoke that to look at the stack without seeing the furnace it would be impossible to tell whether the furnaces were being operated or not. A properly designed underfeed stoker gives a very even and easily controlled fire.

Recombustion by Air Infiltration

M. F. McConnell, superintendent, Mingo Works, Carnegie Steel Co., Mingo Junction, Ohio, stated that in sheet and tin-plate mill furnaces, where the temperatures must be maintained so low as to preclude the welding of the sheet packs under the great pressure of the rolls, the flame must always carry sufficient unsatisfied fuel to make formation of scale in the furnace an impossibility, and so ideal conditions for smoke formation exist. The only solution seems to be the introduction of sufficient additional air to complete the burning of the gas at a point where the steel is not subject to oxidation.

German High Air Temperatures

W. E. Snyder, mechanical engineer, American Steel & Wire Co., Pittsburgh, emphasized the necessity of a regular supply of gas to the heating furnaces and that the air must be supplied at a high temperature. The first is fairly well secured by modern-type, mechanically-poked gas producers. If hand-fired, hand-poked producers are used, the gas goes to the furnace irregularly. At times there will be a large surplus of gas, which simply chokes the furnace and makes excessive smoke. He has seen modern types of German continuous-heating furnaces operating with an air temperature of from 1000 to 1200 deg. All combustion took place in the first third of the furnace; the remaining two-thirds of the furnace was almost as clear as the air outside, and of course there was no smoke. This high temperature of air was obtained by the use of regenerators, and diverting part of the hot gas from the furnace into the regenerator. He has never seen regenerative furnaces of this type in this country, but recuperator furnaces are common, and it is becoming customary to pay more attention to the design of the ducts or stoves used to heat the air for the purpose of getting the temperature as high as possible.

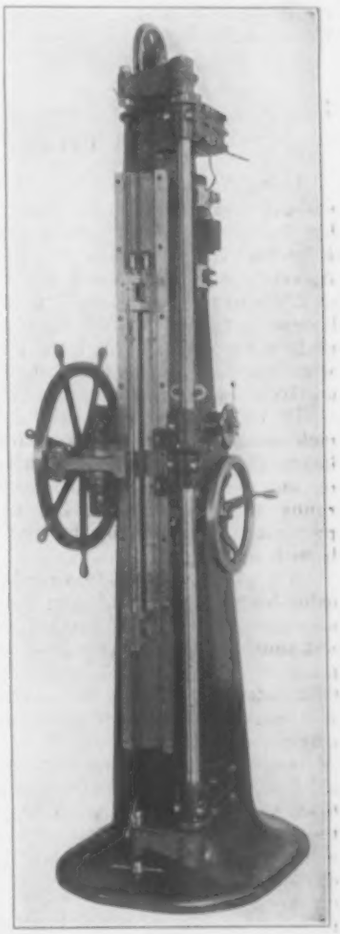
Rushing Ore Shipments

Blast-furnace operators in the Youngstown, Ohio, district believe that furnace stacks in that district will be adequately supplied with ore throughout the winter and until the navigation seasons opens again next spring. A centralized control plan for the distribution of ore to interior furnaces is now being tested. A schedule has been prepared, involving weeks of work, showing the actual ore tonnage needed by each furnace to continue operating up to June 1, 1918, when the next navigation season will be in full operation. Ore is now being distributed from Lake Erie docks to furnaces in that district under direction of the Central Iron Ore Committee of Cleveland. Every effort is being made to reduce delays both at the docks and at interior furnace yards. It is stated the plan is expected to result in placing a sufficient reserve in furnace yards to carry each stock through the winter, if the railroads can furnish the cars.

The Empire State Steel Products Co., Inc., 910-911 Park Row Building, New York, has been reorganized to conduct a general business in iron and steel products, scrap iron and metals, rails, pipe and new and used machinery. M. D. Adelson is president; James P. Touhill, vice-president and general manager; Robert G. Jeffery, secretary and treasurer, and Albert R. Bergstrom, assistant manager.

Straightening Machine for Gun Barrels

To enable the barrels of rifles to be straightened after being drilled or turned off, the Sponsel Co., Inc., 647 Main Street, Hartford, Conn., has brought out a calibrating and straightening machine. Heretofore a deviation of 0.002 in. throughout the entire length of the bore of a barrel, it is explained, has been permissible even though the other operations involved in gun manufacture call for a greater degree of accuracy. The machine, which was designed by Charles W. Sponsel, president of the company, consists of a sensitive electrical apparatus for detecting minute variations from straightness in the bore and the mechanism for applying pressure at such points to bring the barrel into the proper alignment, all of the work being done without removing the barrel from the machine after it has once been placed in position.



The Accuracy of the Interior of a Gun Barrel Is First Determined, After Which the High Spots Are Removed by Causing a Permanent Set of the Metal by a New Calibrating and Straightening Machine

In the operation of the machine the barrel is held in the position shown by two adjustable brackets moving over planed ways on the column. A wire carrying a V-shaped platinum feeder is stretched between the top and bottom of the machine and passes through the bore of the barrel that is being tested. This feeler is fixed in position and the gun barrel is moved past it by manipulating the handwheel at the right of the machine. If the feeler comes in contact with the inner circumference of the barrel, one of the two small electric lights shown directly above the handwheel is extinguished, the other continuing to burn. When the feeler is not making contact with the barrel, both of the lights which are connected in series burn at half the voltage. The arms in which the wire is fastened are mounted at the ends of the vertical shaft to the left of the handwheel and are operated by moving the lever directly above the handwheel. This lever actuates a screw to give an oscillatory movement that brings the feeler toward the wall of the gun barrel or away from it as the feeler is located so that the knife edge always points directly toward the column of the machine.

In straightening a gun barrel the feeler is brought almost in contact with the barrel which is traversed up the column of the machine past the feeler. If this is accomplished without extinguishing one of the lights, the feeler is brought closer to the barrel, the distance of this movement being indicated by a micrometer dial reading to 0.00025 in. The traversing of the gun barrel and the adjustment of the feeler after each movement are continued until a point is reached where one of the lights is extinguished, indicating that contact has been made between the barrel and the feeler. The gun barrel is rotated on its centers through the series of tests to secure accurate results.

If the test indicates the presence of a high spot, a hammer is forced against the front of the barrel by manipulating the handwheel at the left of the machine. This hammer is located opposite an anvil with two supporting points on which the gun barrel is held from the back, the feeler being located midway between the two supporting points. This arrangement is relied upon to produce a permanent set in the metal and remove the high spot, subsequent tests being made with the calibrating apparatus to insure a true circular bore. In straightening a barrel in this way the highest spot determined by the calibrating apparatus is removed first and the work is continued until the bore is perfectly straight or within the limit of accuracy possible with the machine.

Energy Consumption and Other Data on Electric Furnace

Operating characteristics of a 15-ton Heroult furnace, using 60-cycle, three-phase curr ent, were described by Walter C. Kennedy, sales manager Cutler Hammer Mfg. Co., Pittsburgh, in a paper presented before the Association of Iron and Steel Electrical Engineers, at Philadelphia, Sept. 10. The furnace, he explained, has a rating of 3750 kva., its reactance is approximately 10 per cent, and its transformer is arranged with star and delta connections to give 173 or 100 volts on the secondary. An abstract follows:

In normal operation, the high voltage is used to melt down the cold charge, which requires about three hours (input 2500 to 3000 kw.). After the charge is melted the low voltage at about 1000 kw. is used to refine the steel. Also, the temperature proper for pouring is regulated by varying the input a short time before tapping.

A typical run, the furnace being charged with cold open-hearth scrap and pig, low in phosphorus, gave a consumption of 500 kw.-hr. per ton. One slag only was used, the final analysis of the steel being approximately: Carbon 0.15, manganese 0.37, phosphorus 0.02, sulphur 0.03 per cent. However, local conditions will considerably affect the operation and power consumption.

On low voltage (Y connection) to get a power factor about 90 per cent, the maximum input is limited to 1000 to 1200 kw. It is better to keep within this range, as the current is then kept down to 7000 to 8500 amperes, and the conductor loss therefore correspondingly reduced. On high voltage (delta connection) 3200 kw. input can be obtained without any difficulty, although in practice 2400 to 2800 kw. is the usual load. The power factor is practically unity for all values of current and either low or high voltages—if anything, higher on the high voltage.

Successful operation is dependent upon using two or possibly more voltages. At least it is a big advantage to have more than one voltage available, the high voltage to be used for melting down and low voltage for refining. The inductance in the secondary leads need not cause any concern, but the skin effect of the conductors is the greater item.

In this furnace, as in all others at present constructed, the three-phase leads are grouped into three cables before leading to the electrode holders on the furnace. To reduce skin effect, at least on 60-cycle furnaces, the phases should be broken up, say into six leads with the phases interlaced. These six, or possibly 12 leads, should run from the transformer to the furnace. The delta connection should then be mounted on the furnace. It would be entirely feasible to do this and still take care of any current transformers in the secondary circuits. In the present case this would save probably 30 kw.-hr. per ton of metal.

The value of 500 kw.-hr. per ton of metal is a good average figure. This power consumption was obtained at first when low phosphorus scrap was used and one slag. However, later results, using two slags, have not shown any great increase in power consumption.

Carnegie Steel Co.'s "Liberty Mill"

The new plate mill of the Carnegie Steel Co., called "the Liberty mill," at West Homestead, Pa., is a 3-high mill of standard design, with 36-in. rolls, and is served by eight regenerative heating furnaces. The erection of this mill was authorized on April 17 last, work was started at once, and the first plates rolled on Oct. 17, just six months to a day from the time work was started. The mill is driven by a General Electric Co. motor of 2500 hp. and is the first electrically driven plate mill to be operated by the Carnegie Steel Co. It is a cold steel proposition, the slabs being taken from the Homestead Steel Works, or other steel plants of the company, as conditions may require, and reheated in the regenerative furnaces. The mill will roll up to 110 in. wide, and will have a capacity of about 15,000 tons of plates per month. The fact that a mill of this size could be constructed under present unfavorable conditions as regards labor and materials is certainly a creditable record. The task of building this mill in six months was accomplished only by the closest co-operation of everyone that had to do with its erection, and it is a notable fact that clerks and other employees from the Pittsburgh offices of the Carnegie Steel Co., also from the Homestead Steel Works offices and elsewhere, went out in the evenings during the week and on Sundays, unloaded brick from cars, and did everything in their power to hasten the completion of the mill. The mill has been christened as the "Liberty mill" from the fact that most of its output for some months to come will go to the Government to be used in the building of boats and other equipment for the prosecution of the war. The plate mill proper was built jointly by Mackintosh, Hemphill & Co. and the Mesta Machine Co., Pittsburgh, and the Homestead Steel Works. Three large shears were furnished by the Morgan Engineering Co., Alliance, Ohio; the roller tables by the Homestead Steel Works, and the plate straightening rolls by R. S. Newbold Son & Co. of Norristown, Pa.

The starting of the mill was made the occasion of a celebration, and James A. Farrell, president of the United States Steel Corporation, came over from New York to Pittsburgh and pressed the electric button that put it in operation. The buildings cover a site of about 1000 ft. in length and 400 ft. wide. There was a parade prior to the starting of the mill, and one of the streamers carried by Red Cross women read, "When All the Men Go to War, We Will Run the New Mill." Another carried in the parade read, "Six Days Shalt Thou Labor at Regular Work, But on the Seventh and Eighth, also at the 110-in. Mill." Several prominent naval officers were present at the starting of the mill.

Bank for Employees

The American Rolling Mill Co., Middletown, Ohio, has been instrumental in establishing a bank at its East Side plant. The plant is located nearly two miles from the center of the city, and it was found that employees were inconvenienced in getting their pay checks cashed after the regular banking hours. While the building will be constructed and owned by the company, the new bank will be operated exclusively by outside interests. A savings department will be maintained and it is predicted that the experiment will prove to be very satisfactory for the employees, and from the employers' standpoint it will obviate the necessity of workmen cashing their checks in saloons, as is frequently the custom.

The New York Shipbuilding Co., Camden, N. J., has adopted a plan of insurance for all employees, paying the premiums and bearing all expense with funds accruing to the family of the employee in case of death. Those who have worked at the plant for less than two years have been insured for $500 and for every additional year this amount is increased $100.

NEW WAY TO BURN CRUDE OIL*

Gasifying the Oil in a Specially Designed Vaporizer

BY W. A. JANSSEN

THE first spray nozzle for burning oil was developed in America. Since then there have been innumerable modifications of spray and jet burners. These may be divided into two classes, high pressure and low pressure types. Aside from the pressure of operation, they also vary in design and construction, depending upon the atomizing agent used. These burners are dependent for their success on the use of air or steam as an atomizing agent. In addition some burners also have incorporated in their construction some form of spiral for mechanical atomization.

The spray burner consists essentially of a fan-shaped spray of steam or compressed air upon which a stream of oil is allowed to trickle, the oil being diffused or atomized and burned. The jet burners, of which there are many types, are so constructed that a stream of oil is swept into and becomes a part of a stream of air or steam, being atomized therein and subsequently burned. The spray and jet types of burners have their limitations, because of their inability to maintain a positive adjustment of the definite amounts of oil and air necessary to assure and produce perfect combustion. This condition is further aggravated by the use of oils of variable specific gravity, which congeal in cold weather, making perfect combustion almost impossible without the almost constant attention of the furnace operator.

Because of the inability to properly control the air supply to definite combustion proportions, the quantity of air is usually in excess of theoretical requirements for complete combustion, causing a reduced flame temperature. In the spray and jet types of burners, it is essential that there be an abundance of air in order to assure complete atomization and avoid smoking. If the burners are adjusted so as to admit a theoretical amount of air, the oil is not thoroughly atomized, resulting in imperfect combustion, accompanied by excessive smoking and attendant reduction in flame and furnace temperature. The great objection to the present methods of oil burning is because the vaporization and combustion are practically simultaneous and that both occur within the combustion chamber.

Gasifying the Oil

During the past year there has been developed a system of oil burning wherein the oil, instead of being atomized or vaporized, is gasified in a specially designed vaporizer outside of the furnace. The gaseous product is forced into a combustion chamber under positive pressure, resulting in perfect combustion. This method of oil burning consists essentially of producing an oil-gas in a specially constructed vaporizer outside of the furnace proper, through the union of oil and heated air in definite proportions for perfect combustion. The air for combustion is delivered by a compressor at about 2-lb. pressure and a velocity of 150 ft. per sec. The air is forced to the vaporizer through cast-iron preheater boxes placed in the path of the outgoing waste gases. With the admixture of oil in the vaporizer, a gaseous product is formed which is delivered to the combustion chamber under continuous pressure.

The cast-iron preheater, Fig. 1, consists of a closed cast-iron box with openings to connecting boxes for the admission of incoming air. A series of vertical flues are provided to permit the passage of the outgoing waste gases through the apparatus, thus providing a source of heat for preheating the air for combustion. The number of preheaters required is dependent on the oil consumption for which the furnace is designed. They are stacked one over the other, and are so placed in the path of the outgoing gases that their walls will transmit the maximum amount of heat. Each heater is provided with an inlet and outlet opening for the admission of air. They are located on the opposite ends of the heater, necessitating a complete passage of air through the apparatus. As the heaters are stacked, the inlet opening of one connects with the outlet opening of another. With this arrangement the vertical flues are thrown out of line, thereby retarding the flow of the outgoing gases, permitting a greater heat absorption through the walls of the preheaters.

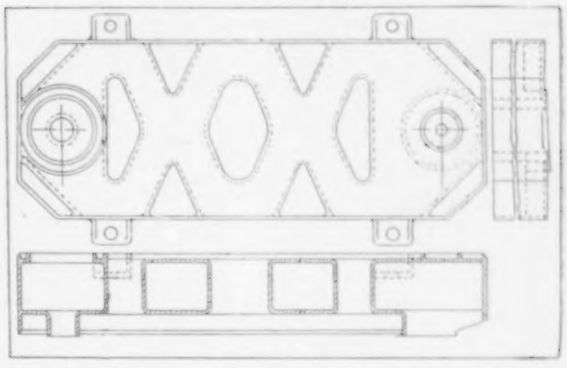


Fig. 1—General Arrangement of the Cast-Iron Preheater

Description of Vaporizing

The vaporizer, Fig. 2, is a hollow cast-iron fitting. Its size is dependent on the calculated oil consumption. It has conveniently arranged inlet and outlet openings. Within the vaporizer are a series of baffles which form a winding zigzag path for the gaseous mixture of air and oil. The long winding passage is essential for complete gasification. The preheated air enters the inlet of the vaporizer and commingles with the oil stream. On striking the first baffle, gasification is begun. The mixture of air and oil gas then winds past the succeeding baffles. It finally is discharged from the vaporizer through a pipe in the furnace wall leading to the combustion chamber.

If perfect combustion is to be attained, the proportions of oil and air must be right and the temperature of the preheated air also must be correct. The installation operates most efficiently when the temperature of the air is about 800 deg. Fahr. Allowing a temperature drop of about 100 deg. for radiation and the conversion of oil to gas, the net temperature of the gaseous mixture is about 700 deg. Fahr. The velocity of the gaseous mixture should be about 150 ft. per sec. in order to prevent back-firing or flame propagation in the direction of the source. This is most essential, as the temperature of ignition, 1050 deg. Fahr., is only a few hundred degrees higher than the temperature of the gaseous mixture, which in the proximity of the heated combustion chamber almost instantly is brought to ignition temperature.

The heavy fuel oils of commerce are practically all

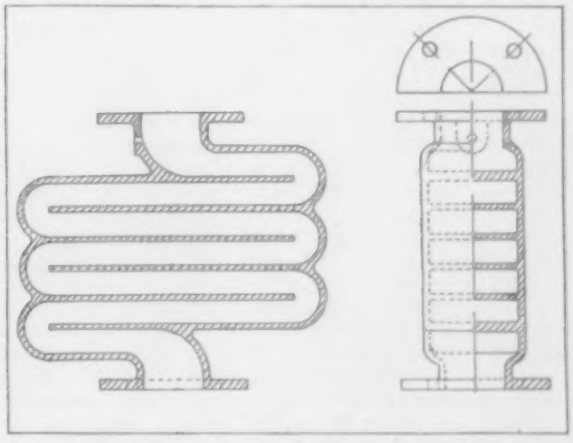


Fig. 2—Two Sections of the Cast-Iron Vaporizer

*From a paper presented at the annual meeting of the American Foundrymen's Association at Boston, Sept. 27, 1917. The author is in charge of production, Canadian Steel Foundries, Ltd., Montreal, Quebec.

of the following composition: Carbon, 84.9 per cent; hydrogen, 13.7 per cent, and oxygen, 1.4 per cent. The Baumé gravity is 26 deg. and the oil weighs 7.4 lb. per gallon. For perfect combustion this necessitates about 3.4 lb. of oxygen or 14.5 lb. of air per pound of oil. This is equivalent to 180 ft. of free air per pound of oil, or about 1500 cu. ft. of free air per gallon. This may be more easily expressed as 25 cu. ft. per minute per gallon per hour.

This method of oil burning lends itself very readily to every type of furnace in which the atomizing types of burners have been used. Oil economies of 40 per cent are not uncommon. A 10 per cent economy alone is effected in the preheating of the combustion air.

UTILIZING BURNED SAND

Experiments on Foundry Facing Sand Mixtures—Success with Pan Muller

A SERIES of experiments to determine the most economical method of mixing and blending sands for foundry facings was described in a paper read by R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, at the meeting of the American Foundrymen's Association, Boston, on Sept. 28, 1917. The object of the experiments was to discover a combination that would permit the use of the greatest possible amount of burned sand, and so decrease the cost of sand per ton of castings produced.

Three methods of testing the sands were used in the investigation, the bond test, the sieve test, and the transverse strength test. The first study was the replacement of the sand ordinarily used by a sand carrying 20 per cent higher bond, which because of the high bond or active clay substance present allowed the use of 10 per cent more old sand in the mixture. The properties of the two sands are shown below.

Composition:	Original Mixture	Mixture No. 1
Jersey sand No 3	72	62
Old sand	20	30
Sea coal	8	8
Total bond	307	435
Transverse strength, grams	440	396

Another mixture consisting of 47 per cent of Jersey sand, 44 per cent of old sand, 1½ per cent clay and 7½ per cent of sea coal gave a total bond of 434 and a transverse strength of 226 grams. While the bond and texture had been maintained, scabbing appeared on many of the castings. Mixing by machine partially overcame the difficulty, but an attempt to decrease the amount of new molding sand by the further addition of clay showed conclusively that the limit had been reached unless a more complete blending of the component parts was made possible by some other type of machine.

There was nothing to be gained in the operation of the mixer in so far as use of less new material was concerned. The only advantage was that it usually permitted the same mixing at a lower labor cost per ton. A careful study of the mechanically and hand mixed sands under the miscroscope revealed no marked difference, in so far as the coating of the burnt grains of sand with the new sand and clay was concerned. Results of the breaking of transverse test bars also revealed no greater tenacity of the grain particles, which would be a criterion of the thoroughness of mixing.

To increase the efficiency of all new material used in the facing by more complete blending, a so-called pan muller was purchased for this purpose. This machine consists essentially of a cylindrical pan, with a bottom of cast iron, about 5 ft. diameter, and sides of sheet steel about 1 ft. high. Resting on this pan are two heavy cast-iron rolls approximately 2 ft. diameter and 8 in. wide. These rolls are held in position by guides which allow revolution only about their respective axes due to contact with the pan and its contents.

While awaiting the arrival of the muller, the mixture designated as No. 2 was run in the foundry for a period of two months. This mixture, which used 1½ per cent of Jersey fire clay together with a high bonded Jersey sand was mixed in a mixer. Eventually it replaced the mixture previously used with a consequent saving of approximately 22 per cent of new material, or approximately 95c. per ton of facing mixed.

The first test employing the muller as a means of mixing was made for the purpose of determining the effect of the mulling action on the character of the facing. The effect of this action, so far as increased efficiency of all new material added is concerned, is best shown by a study of the tabulated results which are recorded below. They represent the breaking loads on three sets of bars made from the same mixture of sand but mixed by hand, in the mixer, and in the muller, respectively.

From the following data it is seen that the mixer offers no better means of mixing so far as the strength of the sand obtained is concerned, but that the muller does by its peculiar action offer a far more efficient means of mixing or blending. The results of the tests are given in an accompanying table.

Hand Prepared Mixture No. 1		Machine Mixture No. 2		Muller Mixer No. 3	
Bars	Ounces	Bars	Ounces	Bars	Ounces
A	9.5	A	10.0	A	12.5
B	10.5	B	9.5	B	13.5
C	10.5	C	10.5	C	14.5
D	10.5	D	11.0	D	12.5
E	10.0	E	9.5	E	10.5
F	11.0	F	10.0	F	14.0
G	10.3	G	9.5	G	14.0
H	10.0	H	10.0	H	12.0
I	10.0	I	10.0	I	12.0
J	11.0	J	10.0	J	12.0
Average	10.3	Average	10.0	Average	13.0

The first sand mixtures for facing purposes prepared in the muller varied in clay content from 1 to 7 per cent and in new sand content from 10 to 50 per cent, these mixtures making use of varying proportions of new sand and clay, in some instances consisting of clay and old sand only and in other instances of only new and old sand.

After a long series of experiments it was found that the bond test could no longer be used as a means of measuring the strength of the sand, the muller so increasing the effectiveness of the mixing as to make bond tests no longer comparative. The transverse test and a mechanical analysis were found to be the most satisfactory for judging the character of a sand. The mixtures given in the following table were finally decided to be the best for the foundry in which the experiments were conducted.

Composition:	Mixture No. 3	Mixture No. 4	Mixture No. 5
Old sand	60	57	57
Jersey sand	30	15	..
Beach sand	..	..	20
Clay	3½	..	..
Millville gravel	..	20	15
Sea coal	6½	8	8
Total bond	441	383	262
Transverse strength, grams	355	310	210

These mixtures all received 1½ min. mulling action, and although prepared for different classes of castings, they are based on the principles of the use of such proportions of new sand, old sand and clay as to give a facing which would not when in contact with the hot metal be subject to scabbing or blowing.

The comparative new material costs of the different mixtures are as follows:

Original Mixture

72 per cent Jersey at $4.	$2.88
8 per cent Sea Coal at $9.	.72
	$3.60

Mixture No. 1

62 per cent Jersey at $4.	$2.48
8 per cent Sea Coal at $9.	.72
	$3.20

Mixture No. 2

47 per cent Jersey at $4.	$1.88
1½ per cent Clay at $7..	.11
7½ per cent Sea Coal at $9	.67
	$2.66

Mixture No. 3

30 per cent Jersey at $4.	$1.20
3½ per cent Clay at $7..	.25
6½ per cent Sea Coal at $9	.58
	$2.03

Mixture No. 4

15 per cent Jersey at $4.	$0.60
20 per cent Millville at $4	.80
8 per cent Sea Coal at $9.	.72
	$2.12

Mixture No. 5

20 per cent Beach at $1.60	$0.32
15 per cent Millville at $4	.60
8 per cent Sea Coal at $9.	.72
	$1.64

SCRAP DEALERS MEET

Vernon Phillips Says Pocketbooks Must Be Forgotten During the War

A meeting of the American Board of Scrap Iron Dealers, which was organized on May 15, this year, was held in the Fort Pitt Hotel, Pittsburgh, on Thursday, Oct. 25, at which about 100 leading scrap dealers from all parts of the country were present. There was a very free discussion among the members of the serious problems facing the scrap industry, and the necessity for prompt and decisive action. The iron and steel scrap trade went on record as determined to do everything possible to help the Government solve the war problems that especially concern the scrap industry, and particularly to co-operate with the railroads in conserving the freight car supply. There was a meeting of the executive committee of the Board on the previous day for the purpose of considering the steps necessary to take to meet the situation, in order to recommend them to the general meeting for action. The result was a presentation of a resolution, which was unanimously carried, in reference to the handling of rejected cars, which is one of the most serious propositions facing the scrap trade, and is the cause for considerable delay in the movement of cars. This resolution embodied the formation of a Bureau of Scrap Inspection, by which all rejected cars are to be handled through an inspection office conducted by the American Board of Scrap Iron Dealers, to which the mills rejecting scrap are to send a notice of each and every rejection, with the cause for the rejection and the name of the shipper. This bureau agrees to see that the rejected car is disposed of or moved within 48 hours of such notice. In order to cover the expense involved, the shipper in each case shall pay an agreed-upon fee for each rejected car. It was also provided that the executive committee should work out a detailed plan so that the bureau could start this work at once. For the present the bureau will be conducted from the office of Secretary C. A. Barnes, Widener Building, Philadelphia, and it is the intention eventually to extend it so as to cover other districts. W. Vernon Phillips of the sub-committee on scrap iron and steel of the American Iron and Steel Institute, and a member of the executive committee of this board, presented a paper on matters of vital interest to the scrap trade.

The Question of Prices

In opening the meeting President Shroder stated that an erroneous idea had gone abroad that this meeting had been called to act in the matter of prices to be fixed for scrap by the Government. He made it plain that, while the question of price fixing was important to the dealers, the matter of rejections and re-consignments of scrap is of vastly more importance to the industry and to the country, and that it must be given immediate attention to prevent railroads from taking drastic action. Representatives of the American Railway Association were present at the meeting and stated the willingness of this association to co-operate with the dealers, and also answered several questions of interest to the trade submitted by several of the members.

The Work at Washington

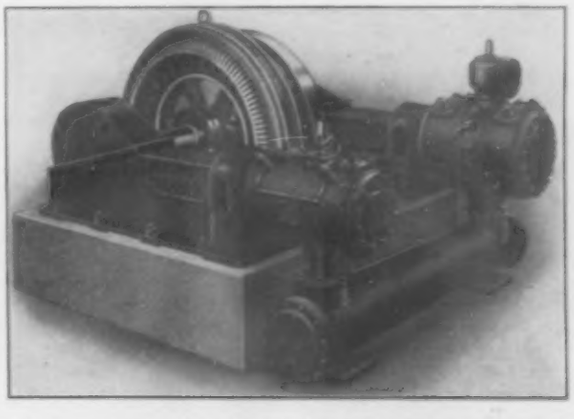
Mr. Phillips in his paper said that the most serious problem of all is that of transportation. He urged that dealers load cars to the maximum whenever possible and that all unnecessary delay in unloading cars should be avoided. Another serious question relates to rejection, and dealers have been warned by the American Railway Association that unless there is some improvement in this matter drastic action will be taken. He said the association should make itself a committee of the whole to punish anyone deliberately "doctoring" a car, a practice which has more than anything else caused ill-repute in the scrap business. Another practice which should be avoided is the making of sales through two or three different hands. In regard to Government action concerning the fixing of prices, Mr. Phillips said in part: "We have been before various committees, last the War Industry Board, and we are glad to say that they were impressed with and have recognized the importance of this business and took our recommendations most seriously. As to whether they will fix the price on scrap material, or at what levels they will fix them, we cannot say. All prices on steel products so far determined have been in agreement with the makers, and as it will be practically impossible to have all scrap producers enter into an agreement, it is apparently difficult to attempt price-fixing without resorting to laws which will make it compulsory. These the Government has no doubt prepared and in good time will be in a position to enforce. So in my opinion they eventually must be fixed. It is to the interest of the country, the trade, and the steel industry that they should be fixed. We do not want to witness rises and falls in the price which prevent the manufacturer from figuring his cost or which encourage dealers to speculate wildly, causing possibly real suffering to many of the smaller dealers in the business. The Government does not want to make any mistake in this matter. It has England's experience to follow, which has been rather a wide one and not an altogether satisfactory one, but while this matter is under consideration by Washington we should use our greatest efforts to regulate the industry in such a way as to prevent abuses and reduce the number of cars being used.

Forget About Profits

"We must forget our pocketbooks to some extent to-day. I know it is hard for anybody to actually do this. Men may want to and may try to, but it is human nature to intuitively reach for our profits and try to save losses before any other consideration. We must change our way of looking at things. So many people in the business are so ready to blame someone else—the railroads, the mills, the dealers with whom they transact business, or anyone but themselves—and if you will all go home resolved to change this point of view, at least until the war is over, you will be doing more for the country than you could do by enlisting, by buying bonds (but every man here should buy Liberty Bonds) or almost any other thing one could mention. Harmony and co-operation is the one needful thing in all lines of effort to-day. I hope and believe that after the war the scrap business will be an industry which will be on a parity with any other industry. We have a magnificent opportunity now to show what we are good for, to prove our sincerity, and it will not take the consumers long to offer you their full support if you give them a reason for doing so."

Small Direct-Connected Air Compressor

In 1904 the Laidlaw-Dunn-Gordon Co. furnished an air compressor to the General Electric Co. for installation at the latter's Schenectady plant. This was directly driven by a 175-hp. motor. Since that time high-speed automatic strip and disc valves have been developed until compressors having a capacity of 1500



Air Compressors with the Driving Motor Mounted Directly on the Compressor Shaft Are Now Built in Sizes Ranging from 400 to 6000 Cu. Ft. Per Minute

cu. ft. per min. have been built in which the driving motor is mounted on the compressor shaft. Further development of the valves and the smaller sizes of synchronous motors have made it possible for the Worthington Pump & Machinery Corporation, 115 Broadway, New York, to develop a standard line of direct-connected air compressors varying in size from 400 to 1500 cu. ft. per min.

The general construction of the compressor is the same as the larger sizes which have been on the market for some time. The air end is equipped with the Laidlaw feather air valve which was brought out about three years ago. Since that time approximately 1000 compressors equipped with these valves have been built and installed. The capacity of these machines varies from 200 to 6000 cu. ft. per min., the total being in excess of 750,000 cu. ft. per min.

Busy Plants at Seattle

The growth of Seattle, Wash., as a center for the iron and steel industry in the Northwest is illustrated by the fact that new plants and enlargements in iron and steel manufacturing, exclusive of shipyards, during the last four months amount to nearly $900,000. According to reports specially prepared by the Seattle Chamber of Commerce and Commercial Club, 12 new plants have either been erected or are in course of erection, since July of this year, valued at more than $800,000. Four plants have increased their capacity by additions made at a cost of more than $75,000. Never in the history of the city has there been such an unparalleled number of machine shops, foundries, manufacturing plants, forges, etc., and every plant is rushed to capacity with work.

Despite the lumber situation, which has resulted in the closing of most of the larger mills throughout the Northwest, the Puget Sound Machinery Depot, one of the largest plants manufacturing sawmill equipment in the West, has been so crowded with work that a $60,000 enlargement of the machine shop and works is now being made, that will double the plant's capacity.

New Carnegie Shape Book

The sixth edition of the Shape Book of the Carnegie Steel Co. has been issued. As compared with the fifth edition, issued only two years ago, the 227 pages devoted exclusively to profiles of sections have increased to 265 pages. Noteworthy increases in the number of sections rolled are to be found in the portions of the book devoted to shipbuilding bulb angles, sash and casement sections, automobile sections and cross ties. The increase in the number of these sections rolled is due to the remarkable expansion in shipbuilding, to the extensive use of steel cross ties for industrial and railway purposes, to the great increase in the automobile industry and particularly to the great development in the use of steel in frames for windows, doors and skylights in modern factory buildings. As heretofore, the book is bound in green leather, with gilt tops, and can be obtained at any of the district offices of the Carnegie Steel Co. for $1 per copy.

Technical Men Needed

Major J. E. Bloom, U. S. A., 266 Market Street, Newark, N. J., calls attention of all technical men to the need of the Army for men, aged 18 to 40, in sundry branches of "Technical Troops." He says any technical men who are exempt or who from any cause cannot volunteer can efficiently co-operate, by forming technical patriotic educational guilds in their several industries or home neighborhoods, especially to look after the welfare of men in the service, and to give them the opportunity of obtaining technical assistance, opinions and advice from home, in any war industry, from time to time.

The Spicer Mfg. Co., South Plainfield, N. J., manufacturer of small screw machine products and universal joints, has changed its firm name to the Spicer Mfg. Corporation.

Light Rail Freight Rate Decision

WASHINGTON, Oct. 30.—A reduction in the carload rates on light steel rails from Huntington, W. Va., to New York and other Eastern basing points has been ordered by the Interstate Commerce Commission in the complaint of the West Virginia Rail Company against the Chesapeake & Ohio and other railroads. The commission holds that the domestic rates heretofore in effect are not justified and that they should not exceed the authorized basis of 77 per cent of the Chicago-New York rate, or $3.80 to New York, $3.60 to Philadelphia and $3.50 to Baltimore. The rates for export, the commission orders, shall not exceed 77 per cent of the contemporaneously maintained export rate from Chicago to New York.

While the normal basis for making class rates from Huntington to the East is 87 per cent of the Chicago-New York class-rate scale, the carriers serving Huntington have, in respect of commodity rates, accorded it something less than the rates which would result from that percentage relation, and have adopted, on many commodities, including steel rails, a basis of 77 per cent of the Chicago-New York rates. The rates from Huntington to the interior basing points, taking rates lower than the Atlantic seaboard cities, were made approximately on a basis of 82 per cent of the Chicago rates to these points based on the Chicago-New York scale, with the rates to New York made on the basis of 77 per cent of the Chicago-New York rate as maximum. But, although the 77 per cent basis was adopted as a fair and reasonable one on certain commodities, including iron and steel products, the domestic rates from Huntington to Eastern seaboard points have never been published on that exact percentage, and it was not until Feb. 24, 1917, when that relation would permit of an increase in the export rates from Huntington, that the export rates were so adjusted. For example, at the time the complaint was filed the Huntington-New York export rate was related to the Chicago-New York export rate as 96 is to 100, or 92c. over Pittsburgh per 100 lb. If the export rate from Huntington in effect prior to Feb. 24, 1917, had been on a basis of 77 per cent of the Chicago-New York export rate, it would have been $2.54, or 70c. over Pittsburgh. While the export rate from Huntington to New York was thus increased from $3.16 to $3.54, or 38c., the increase from Pittsburgh was from $1.84 to $2.76, or 92c. Corresponding increases of 92c. were made from Newark and the Ohio points which carry a 40c. differential over Pittsburgh. The increase from Chicago was from $3.30 to $4.60 in the export rate to New York, and from Cumberland, Md., from $1.64 to $2.56.

The rates which will go into effect were made upon voluntary agreement by the roads. The decision of the commission made these concluding remarks: "We find that the carriers' proposed basis of 60c. over Pittsburgh to the seaboard, domestic and for export, is not unreasonable. It would virtually make Huntington a 73 per cent point, as related to the Chicago export rate, and would yield per ton-mile 5.12 mills, as against a ton-mile yield of 5.29 mills from Newark, Ohio, its nearest competitor. It is proposed with a view to relieve Huntington from a competitive standpoint, and carriers may accord rates to meet competition which we would not require established. It is expected that within a reasonable time the respondents will in good faith establish the basis proposed, which will remove the discrimination in respect to the Baltimore & Ohio and align their rates to the Eastern basing points to accord therewith." W. L. C.

A table showing that more than 18 lb. of metal enters into the composition of articles required for the equipment of each infantryman has been prepared by the Ordnance Bureau of the War Department. The metal equipment carried by each infantry soldier weighs 294.65 oz. and an additional weight of 114.7 oz. is added by equipment of cotton, wool, leather and wood. The Ordnance Bureau, therefore, supplies each soldier with approximately 25 lb. of equipment, which is exclusive of that supplied by the quartermaster corps.

GATHERING CONTRACT DATA

Federal Trade Commission Asking Iron and Steel Trade for Contract Details

WASHINGTON, Oct. 30.—A comprehensive canvass of the iron and steel industry has been undertaken by the Federal Trade Commission, presumably for the purpose of securing data upon which to base a recommendation to Congress for the incorporation in the pending Pomerene steel price-fixing bill of a provision abrogating existing contracts. The commission has gone to work systematically to gather data relating to this subject and intends to reinforce its recommendations not only with statistics showing the extent to which the output of the coming six months or more is tied up by contracts, but also with a general consensus of the views of both producers and consumers. The scope of the inquiry undertaken may be gathered from the questionnaire sent out by the commission under date of Oct. 20 to a very large number of corporations and individuals, as follows:

The Federal Trade Commission desires information with respect to the extent to which the manufacturers of iron and steel products are covered for the next nine months with respect to chief raw materials.

Please furnish as promptly as possible and as nearly as may be practicable, information regarding the chief materials used by you (including iron ore and coke) for the manufacture of iron and steel and the products thereof, which were contracted for but have not been delivered prior to Oct. 29, 1917, as follows:

1. The total quantities of each.

2. The quantities of each for the principal contracts, severally, the date on which each of such contracts was made, the periods of delivery and the prices (indicating the f.o.b. point). State which, if any, of these contracts are with affiliated companies.

Please indicate any of these contracts which are subject to change in any important terms, stating how, or subject to cancellation or non-fulfillment at your option.

Please furnish information regarding the extent to which you have outstanding contracts for the sale of your products for the remainder of the calendar year and for the first and second quarters of 1918.

(a) The total quantities, by classes, distinguishing those ordered by the United States Government, and as far as possible those ordered for domestic consumption and for export;

(b) The chief contracts, with quantities, dates, and period of delivery and prices.

Please furnish similar particulars, both for purchases and sales contracts, with respect to any controlled or affiliated companies.

The commission would also be pleased to receive from you an expression of opinion, in case prices should be fixed by law, of the advantages and disadvantages of providing that prior bona fide contracts for materials and for products bought and sold should be abrogated. In connection with any opinion, statistical data additional to that requested above, in support of your views, are also desired.

Enough replies have been received to show the diversity of interest on this important question and to demonstrate that however strong the Commission's recommendation for the abrogation of contracts may be—if such recommendation should be forwarded to Congress—it is certain to meet the organized opposition of those whose interests are opposed to the projected drastic action. Many manufacturers have assumed that the constitution of the United States forbids Congress to pass a law abrogating a contract not in itself contrary to public policy, believing that such agreements may not be interfered with by the Federal Government even in the exercise of the right of eminent domain or pursuant to the extraordinary authority rather loosely described in the term "war powers." Experienced lawyers, however, freely admit that Congress can nullify all such agreements as those in contemplation and furthermore that the method of procedure is reduced to an academic question by the fact that the Federal Government has the broadest powers with respect to the commandeering of products essential in the carrying on of the war. It is, therefore, suggested that the question before Congress is not a problem in constitutional law but one of national policy.

That the Federal Trade Commission has deepseated convictions respecting the advisability of abrogating existing contracts in the iron and steel trade has been evidenced by various expressions of opinion by individual commissioners. Commissioner Davies made a statement before the Senate Committee on Interstate Commerce during its consideration of the Pomerene bill which has been taken in some quarters as a suggestion that the Trade Commission be clothed with power not to abrogate all contracts but merely those made at prices above the schedule fixed by the President. This opens up a vista of possibilities of great significance to the industry as a whole. The situation would be further intensified should the Commission be invested with authority to use its discretion in abrogating contracts so that it might cancel only those involving serious hardship to one of the parties thereto. In view of all the ramifications of this grave problem the development of the Commissioner's project will justify the closest attention on the part of interested parties. W. L. C.

German Dismantling of Belgian Steel Plants

The dismantling of Belgian steel plants by Germans is thus described by a correspondent of the London *Ironmonger*, serving with the Belgian army:

As long ago as May 25 the Germans dismantled the plant of the Angleur Steelworks, and announced their intention of removing the traveling cranes. By order of the invaders, the blast furnaces of Ougrée had to stop work on May 24 and the Germans are now dismantling the plant there also to send it to Germany. The Cockerill works at Seraing had in some measure been spared but several hundreds of German workmen recently arrived there from Westphalia and proceeded to strip the place. At other plants the Germans are removing the rolling equipment (cylinders made of high-grade castings), shafting, belting and even the foundation plates. The Germans are breaking up the big cast-iron posts to be recast. The big blowing machines of the Usines Bonehill and the Usines Boël, the 4-cylinder machine of the Providence Works, which was exhibited at Liège International Exhibition in 1905, and the blooming mill of the same company are reported to have been converted into scrap iron.

Germany's Iron and Steel Output

In the months of June, July and August, this year, the German pig-iron and steel output "showed absolutely brilliant figures," while the production of finished products has been brought to a level which "at any rate in a certain measure meets the requirements of the army," according to a recent report on the Rhenish-Westphalian steel industry in the *Kölnische Zeitung* and published in the London *Ironmonger*. The pig-iron syndicate has increased the prices of all grades of pig iron, with the exception of Luxemburg iron, as from Sept. 1. The advances in hematite and in low-phosphorus steel-making irons are very considerable, but the other grades have only gone up by a few marks.

A Cast Pipe Freight Rate Complaint

A complaint against the carload rate of $5.37 per net ton on cast-iron pipe from North Birmingham, Ala., to Watervliet, Mich., has been filed with the Interstate Commerce Commission by the American Cast Iron Pipe Company, naming the Louisville & Nashville and other railroads as defendants. It is declared that a reasonable rate would have been $5.11 per ton. The rate is said to violate the long and short haul clause as it exceeds the rate from North Birmingham to Grand Rapids, Mich., and other points on the Pere Marquette.

About 2000 steel workers employed by the Union Drawn Steel Co., the Moltrup Steel Products Co. and the Standard Gauge Steel Co., Beaver Falls, Pa., are out on strike with demand for a 10 per cent increase in wages.

The Lalance & Grosjean Mfg. Co., Harrisburg, Pa., manufacturer of enameled ware, has advanced the wages of employees 10 per cent., effective Oct. 26. This is the third such advance this year.

PROPERTIES OF BRASSES

Working Qualities—Rolling Mill Alloying Problems—Bronzes

THAT non-ferrous alloys such as are employed in the brass rolling mills for the manufacture of sheets, strips, wire, rods, tubes and shapes of various cross-section designs, must be made from mixtures which permit elongation and reduction of cross-section area without fracture was emphasized by R. A. Wood, Cheshire, Conn., in a paper presented before the American Institute of Metals at Boston, Sept. 27. This he said places certain restrictions on the selection of the metals used in making the alloy which are described in the following abstract.

General Requirements

The metals employed must be of good quality and practically free from impurities. Care must be taken to avoid even traces of antimony or bismuth, for these metals if present will tend to cause the metal to break up during fabrication, to fire crack in annealing and to develop season cracks.

Copper and its alloys readily absorb sulphur and this tends to cause the metal to become spongy and porous in spots. Sulphur present in considerable quantity will cause the metal to be brittle and to break up in fabrication. Absorption of sulphur takes place in the melting operation and is caused by improper protection from the gases of combustion. Care should be taken to select a fuel as free from sulphur as circumstances will permit. Charcoal, when broken up into fine pieces, absorbs sulphurous gases and the metal should be protected by a good covering of charcoal in the melting operation. Metals containing arsenic to any considerable amount should be avoided for the influence of this metal on the alloy is similar to that of both bismuth and antimony. Also care should be taken to select a grade of zinc suitable for the uses to which each particular alloy is to be applied. Only the best grades of copper are safe and it is well to have the copper cut into small pieces in order that it will not protrude over the top of the crucible and be exposed to the gases of combustion.

Copper and Zinc Alloys

A mixture of approximately 50 parts of copper and 50 parts of zinc has the highest content of zinc the alloy may contain and be workable. It is possible to roll such an alloy into a sheet or draw it into a wire, but the operations are tedious.

Alloys of from 57 to 63 parts of copper and the balance zinc are used in the extruding process for making rods, tubes and shapes. Mixtures of this nature may be rolled hot and are representatives of the commercially hot worked alloys. These mixtures are known under various trade names such as Muntz metal, yellow metal, yellow sheathing, condenser tubing, extruded metal, etc.

The grade of metal for making hot working alloys must be carefully selected and the casting operation carefully carried out. It is not necessary to buy new material as some mills make a practice of buying up scrap and melting it in a reverberatory furnace, casting this in bars which may be either rolled hot or extruded; but these mills have a highly specialized melting crew which can tell from experience and certain physical tests when the metal is in proper condition for casting.

A mixture of 60 parts of copper and 40 parts of zinc is about as cheap an alloy as can be successfully worked cold, although there are mixtures of from 57 to 59 parts of copper and 43 to 41 parts of zinc which may be rolled into sheets or drawn into wire. Alloys of this nature are used mostly for hard soldering purposes.

Working Copper-Zinc Alloys

The successful working of the foregoing mixtures depends primarily on the skill with which the casting operation is carried out. Alloys containing a high percentage of zinc do not, as a rule, polish up nicely. Care must be taken in annealing these alloys. They are apt to run in places if slightly overheated. They are very soft and pliable at a red heat but upon cooling become somewhat hard and springy. If plunged into a tank of water immediately after being removed from the annealing furnace they will remain much softer than if allowed to cool gradually. This is more or less a risky procedure for if the plunging temperature is not just about right some of the metal will split and crack. These cracks are known as water cracks and they must not be confused with fire cracks which they closely resemble. If the hot metal is cooled off by means of a stream of water, such as is thrown from a hose pipe, water cracks will develop, but if a fine overhead spray of water is used this will not occur.

Fire cracks are caused by an unequal stress within the metal which causes an unequal expansion tending to pull it apart. A metal which has been thoroughly worked seldom fire cracks. Season cracks are caused by the gradual equalization of strains within the metal. However, overworked metals will, in some instances, develop season cracks. The grade of metals used in the alloy, the melting practice and the mechanical operations applied to the metal all contribute to the cause of season cracking. Straight copper-zinc alloys containing more than 65 per cent copper, if properly worked, seldom cause trouble due to water, fire or season cracking.

Metals which have been properly cast and rolled or drawn should, if rightly annealed, have a good surface and a close grain and in almost every instance, when a porous, open or coarse-grained metal is encountered, the trouble is in the annealing operation.

Alloys containing 80 per cent or more of copper often cause trouble due to the presence of small pinholes and blisters. These defects invariably have their origin in the casting shop and if the caster understands the melting and pouring of the rich metal mixtures no more trouble need be experienced than with the alloys containing a higher percentage of zinc.

Influence of Lead and Tin

The foregoing alloys possess the common characteristic of being of a tough and tenacious nature, and will be found difficult to work under a tool for milling, turning, drilling or engraving purposes. To impart the free working qualities a certain amount of lead is added to the mixture.

Lead impairs the cohesive quality of the metal and alloys containing it will not stand as great a reduction without cracking as will the alloys free from lead. Alloys containing lead do not have as close a grain as those which are free from it and consequently do not polish up as well. Leaded mixtures are as a rule poured at a lower temperature and care must be taken not to overheat them in melting as this will most likely cause fine black specks.

For a number of purposes a very tight and close-grained metal high in tensile strength is wanted and this is generally produced by the addition of tin. The casting of alloys of this nature must be carefully carried out, otherwise the surface of the finished material on being bright-dipped or polished will show numerous fine white streaks and, in some instances, slivers. The molten metal should not be brought to a higher heat than is necessary and the tin should be pushed under the surface of the metal as quickly as possible, shortly before it is poured. The mixture is then given a thorough stirring. Alloys containing tin seem to develop season cracks much quicker than some of the other mixtures and this is especially true of the spring tempered brasses.

Use of Phosphorus and Iron

The addition of a small percentage of phosphorus (generally in the form of phosphor-tin or phosphor-copper) to copper-tin alloys greatly simplifies the casting operation as it tends to reduce the oxides and causes the molten metal to become more fluid producing a more solid and malleable as well as a more ductile casting. Alloys of this nature are generally put on the market under the name of phosphor bronze. As a rule the phosphorus is added to the mixture shortly before

it is ready to be poured. Many manufacturers do not consider it good policy to add phosphorus to mixtures containing zinc, claiming that it has a tendency to produce fine pinholes in the castings. This question may be open to some argument. The addition of too much phosphorus should be avoided as an overdose will not only cause pinholes in the casting but will also increase the difficulties of rolling, due to cracking, etc. Many manufacturers consider .05 of phosphorus good practice. Certain classes of work call for a metal of a very dense grain and exceedingly high in tensile strength and for these properties iron is added. The shrinkage of the casting while cooling is excessive in alloys of this nature and unless the melting and pouring operations are skillfully carried out the castings will pipe. The iron if not properly introduced to the mixture will segregate in small nodules as hard as steel. It is customary to first make an alloy of copper and iron. A little manganese in the form of cupromanganese materially assists in distributing the iron evenly throughout the mixture. Alloys containing iron are more or less hard and springy and some of the mixtures are very refractory, but if the melting and pouring operations have been properly carried out, they may be rolled or drawn, though the reductions cannot be as heavy as is the case if alloys are free from iron.

If spelter is used care should be taken to select a brand free from lead, for if any appreciable amount of lead is contaned in the alloy it is likely to break up in the rolling operation, or give trouble due to fire cracking. The lead will also cause low tensile strength.

Federal Export Corporation Establishing Quarters in Orient

Dwight S. Guthrie, Guy L. Bayley and Burtin Honig of the Federal Export Corporation left Vancouver Oct. 25 for Yokohama, where temporary Oriental headquarters will be established.

Mr. Guthrie, a vice-president of the corporation, has been closely associated with its development, having had charge of the iron and steel department since its formation. He has traveled in Europe, where he lived as resident foreign sales manager for the National Steel Co. and the American Steel Hoop Co., but before joining the Federal company he was district sales manager for the Republic Iron & Steel Co. in St. Louis, Birmingham, Cleveland and Chicago.

Mr. Bayley was chief electrical and mechanical engineer of the Panama-Pacific International Exposition, and when the new water system for San Francisco was undertaken he was made chief engineer of the project. He was a resident consulting engineer in Japan for a number of years, covering mines, railroads and industrial concerns.

Mr. Honig, who will have charge of the Oriental mercantile department, has spent the past seventeen years in selling American products in India, Japan, China, Java and Australia.

It is expected that Mr. Guthrie and Mr. Bayley will return to the United States in the early summer of 1918 and later Mr. Bayley will make his residence in Shanghai or Yokohama, where the warehouses of the Federal company will be situated. Mr. Honig is accompanied by his family and will remain in the Far East permanently.

Manganese Ore Exports from India

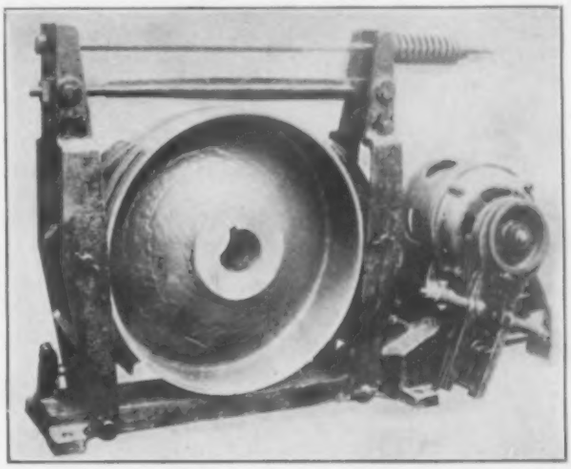
Apparently exports of manganese ore from India have been larger in recent months than a year or two ago. For the fiscal year ended March 31, 1917, the total was 631,083 gross tons, of which 459,150 tons went to Great Britain, as compared with 472,563 tons to March 31, 1916, of which 380,967 tons went to Great Britain. The March exports this year were 63,885 tons against 28,201 tons in March, 1916.

The Johnston Harvester Co., Batavia, N. Y., has effected a reorganization by the formation of a new corporation, the Massey-Harris Harvester Co., Inc.

A Motor-Operated Clasp Brake

Two new types of clasp brakes have been developed by the Cutler-Hammer Mfg. Co., Milwaukee, Wis. One of these, that illustrated, is designed for use on alternating-current circuits and is actuated by an electric motor, while in the other, which is designed for direct-current work, the motor is replaced by a solenoid.

The brake is driven by a high torque squirrel cage motor geared to a sector which in turn is linked to the brakeshoe arms. The application of power causes the motor to revolve until the brake is released after which it stalls and keeps the brake in the released position



A Recently Developed Alternating-Current Brake Is Operated by a Squirrel Cage Motor Geared to a Sector Which in Turn Is Linked to the Brakeshoe Arms

until the current is interrupted. One of the points emphasized in connection with this arrangement is that the brake is silent at all times. Adjustments for wear are made by turning a nut on the end of the thrust rod at the top of the brake and it is explained that this adjustment is required only two or three times during the life of the brake lining.

The construction of the direct-current brake is the same except, of course, for the substitution of a solenoid for the motor. This brake is made in six standard sizes ranging from 8 to 27 in. with ratings up to 250 hp. The range of sizes in which the alternating-current brake can be supplied is from 8 to 30 in. with the same maximum horsepower.

New Oil Cups as Substitute for Grease Cups

A self-closing, spring lid oil cup, made in several models, and designed to supplant grease cups on automobiles, although adapted also for use on grinding machines, porcelain and brick-making machinery, etc., is manufactured by the Gits Bros. Mfg. Co., 553 West Monroe Street, Chicago. The cups are made of brass, and the hinged cover is actuated by a powerful spring. They have been substituted on some makes of automobiles in place of grease cups and can be applied to any automobile. A feature of the device is the strength of the hinge, tests having demonstrated that if great force is applied the lid will break without destroying the hinge, the bracket of which is brazed to the cup proper. The cups can be filled without touching them with the hands. They are made straight where they are to be used in a vertical position, and with angles where the lubrication is done from the side.

The National Rivers and Harbors Congress will hold its fourteenth annual convention in Washington, D. C., in the new National Museum on Dec. 5, 6 and 7. The fundamental purpose, it is explained, is not to urge appropriations for new projects but to plan how the Government, the cities and the people of the United States may most effectively co-operate to "Use the Waterways and Win the War." S. A. Thompson, 824 Colorado Building, Washington, is secretary.

Speeding the Shipbuilding Program

WASHINGTON, Oct. 30.—Following the announcement last week that France would be supplied with American ships, the United States Shipping Board has consented to charter 25 American ships to Italy, representing about 100,000 tons dead weight. All will be steel freighters of sufficient speed to make it practicable to operate them through the submarine zone. Deliveries under charter are to begin immediately. They will include new vessels just off the ways and American ships commandeered by the Shipping Board. The commandeered tonnage will be withdrawn from Central and South American trade chiefly and from the coastwise trade where possible. American ships will not be withdrawn for the present from the Pacific, where they are being used to bring wheat and rubber from India and hemp from the Philippines. These ships, however, will be ultimately withdrawn for the Atlantic trade.

The duty of supplying vessels to meet the war needs is gradually being shifted to the United States. Great Britain has answered the demand to her limit, and now the United States must meet the emergency; therefore the Shipping Board is directing its greatest energies to increasing the supply. Admiral Capps, general manager of the Emergency Fleet Corporation, has been subjected to severe criticism, but most of this has been unjustified. The shipbuilding program has been materially hampered by the shortage of labor. We have at present approximately 200,000 men working in American shipyards. The Fleet Corporation is striving to increase this number to 500,000. The task is monumental. It is estimated that one workman will produce a ton dead weight per month. Therefore, it will require 500,000 workmen to produce the 6,000,000 tons of ships next year now on the program. How to find the extra 300,000 laborers needed is the great problem. If 500,000 workmen can be secured American shipyards will work three shifts a day, thereby strictly observing the eight hour law. Running American yards on a three shift plan will be an innovation, but not one which is absolutely untried. It is now in operation in two plants on the Pacific coast, and, it is said at the offices of the Shipping Board, one wood shipyard in Maine is thus being run.

The Emergency Fleet Corporation begins this week a new line of action calculated to increase the output of American yards. To-morrow, Wednesday, Admiral Capps will hold a conference with representatives of all the Atlantic shipyards to consider all matters relating to existing conditions. Assistant Secretary of the Navy Roosevelt and other officials will participate. Admiral Capps has also invited representatives of the American Federation of Labor and of the Department of Labor to join in the conference, which is expected to be momentous in the shipbuilding program. The output of the yards in the past three months has fallen behind the output for the month of June. This is due, it is felt, to the delay in settling the steel price controversy, labor strikes and the uncertainty regarding commandeering.

Admiral Capps has, however, practically completed all the preliminary work and finally settled upon contractual questions. That the building program may be rushed, he will surround himself with a group of experts drawn from shipyards and contractors' forces and including other men of business experience.

W. L. C.

Government Limits Use of Cars

WASHINGTON, Oct. 30.—To provide cars for the transportation of coal, coke, ore and limestone for the iron and steel industry and raw materials for the sugar and fertilizer industries, Robert S. Lovett, administrative officer under the provisions of the priority shipments act, has issued an order foreshadowing the drastic treatment to be given the transportation problem whenever necessary to keep in full operation the industries of prime importance in the waging of the war. Judge Lovett's order forbids the use of open top cars for the transportation of articles not essential to the national defense or security. The policy upon which this order is based contemplates additional rulings from time to time discriminating against the transportation of the materials or finished products of industries which may be held to be non-essential from the war-waging standpoint, and further developments will be awaited with the liveliest interest. Judge Lovett's order is briefly as follows:

On and after the first day of November, 1917, and until further order, all common carriers by railroad in the United States in the distribution of open top cars, other than flat cars, and in the transportation of freight in such cars shall deny the use of open top freight cars other than flat cars to shipments of the following commodities and articles, except in shipments for the United States Government:

1. Materials and supplies, other than coal, for the construction, maintenance, or repair of public or private highways, roadways, streets or sidewalks.

2. Materials and supplies other than coal, for the construction, maintenance or repair of theaters or other buildings or structures to be used for amusement purposes.

3. Materials and supplies other than coal, for the manufacture of pleasure vehicles, furniture or musical instruments.

4. Passenger vehicles, furniture and musical instruments, which articles the undersigned finds are not essential to the national defense and security.

Numerous reports are current to the effect that other industries are soon to be made the subject of discriminatory rulings similar to the above, but it can be stated on the highest authority that no decision has been reached as to any immediate extension of the newly adopted policy.

W. L. C.

Frank A. Scott's Health Compels Retirement

WASHINGTON, Oct. 30.—Frank A. Scott of Cleveland, formerly of the Warner & Swasey Company, has been forced by the recurrence of a serious physical difficulty from which he suffered in 1912 to resign the chairmanship of the War Industries Board. His position is being filled by Robert S. Lovett, vice-chairman of the board, pending the selection and appointment of a successor. At Mr. Scott's earnest request, his resignation was accepted by Secretary of War Baker, the chairman of the Council of National Defense. In accepting the resignation Secretary Baker said it was with the deepest regret, and added:

I have no doubt that some appropriate minute of recognition of your services will be entered upon the record of the Council of National Defense, but, in anticipation of formal action, I beg leave to assure you that we deeply appreciate the self-sacrifice as well as the value of the service you have rendered, and count it a most fortunate thing for the Government that it was able to have your knowledge, zeal and splendid spirit as a part of the organization with which it faced the early and difficult tasks of industrial organization for the war.

Mr. Scott began his work in Washington as expert adviser of the War Department, giving his special attention to the requirements of the Ordnance Bureau. At that time the War Department was seeking to expand the resources of many private establishments with which the Ordnance Bureau desired to place contracts. Mr. Scott's broad knowledge of the metal-working industry proved of great value, and with his aid a substantial measure of order was brought out of the existing chaos. One of his chief functions was to take up obstacles encountered by manufacturers unable to secure certain materials or the co-operation of other producers and to develop a co-ordination that served to remove obstructions and greatly increase production. So valuable was his work to the Ordnance Bureau that the Munitions Board was organized with Mr. Scott as its head, and under this board the work of the War Department and of the Ordnance Bureau in particular developed with great rapidity. Subsequently, when it became necessary to do for the entire Government what had been done so successfully for the War Department, the War Industries Board was formed, with Mr. Scott as chairman and with Judge Lovett and Mr. Brookings as his most active assistants.

For the past three months Mr. Scott has worked

night and day, with utter disregard of his personal comfort and with little or no attention to the admonitions of his physicians. His task has been unusual in that he has been called upon not only to develop the broad policies of the Government with respect to the purchase of war material and allied problems, but also to give his attention to the multitudinous minute details that have arisen daily in the work of the War Industries Board. All branches of the Army and Navy have relied upon him for advice and assistance, and his knowledge of the manufacturing industries of the country has been daily drawn upon by scores of purchasing agents and other officials of the various departments.

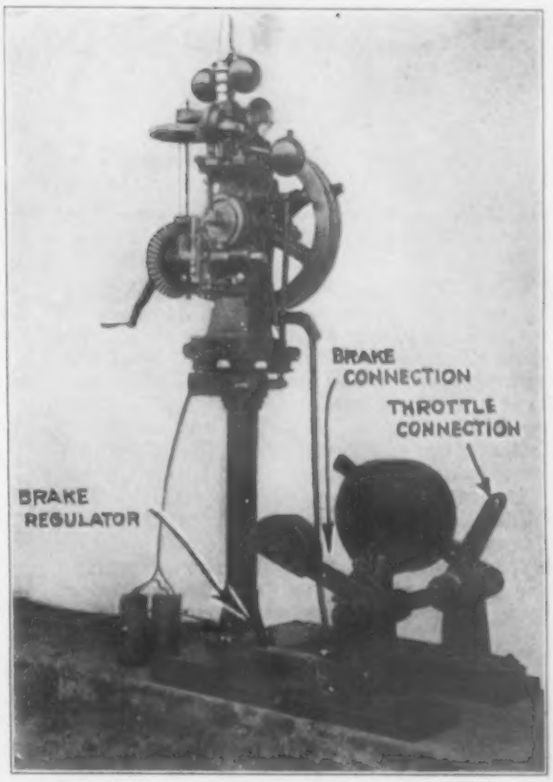
While there have been rumors of friction in the relations of almost every important official with his associates, not a suggestion of this kind has been heard with respect to Mr. Scott. His defense of the contracts of the War Department for rifles silenced all criticism among members of the House Committee on Appropriations, and the satisfactory rate of delivery since secured has amply justified his course. W. L. C.

Controller for Hoisting Engines

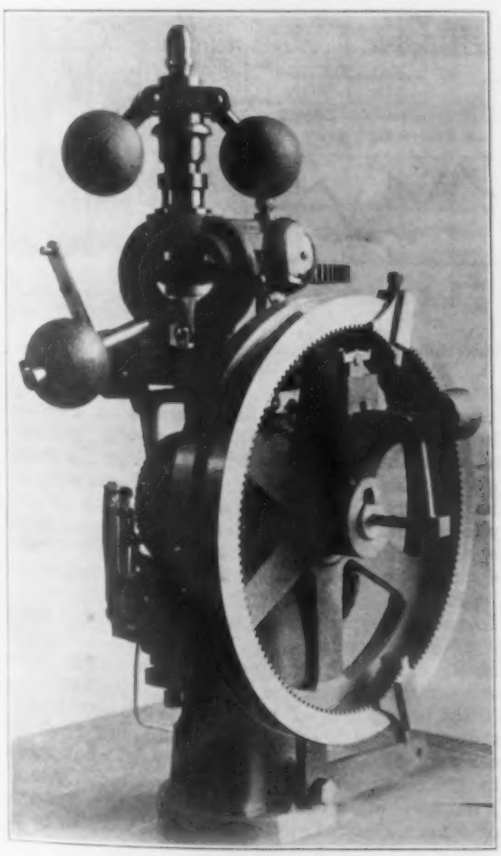
To guard against overtravel and overspeeding of mine hoists operated by steam engines the Maritime Motor Car Co., Ltd., Vancouver, B. C., has placed on the market a controlling apparatus, here illustrated. The action of the controller is variable in its rapidity, depending upon what is to be done. When it is brought into play it shuts off the throttle and sets the brakes and where necessary will reverse the valve gear and operate the relief valves. After the throttle has been closed and the brake set, if the engineer finds it necessary, he may reverse the engine and again open the throttle and turn steam against the pistons to assist in stopping the engine.

The controller works in unison with the drum of the hoist. It has an internal ratchet wheel which is supported on a sleeve extending from the central portion of the stand. An arm carrying a governor-operated tripping pawl travels within this ratchet wheel in clockwise and counterclockwise directions in direct ratio to the travel of the cages in the shaft. Adjustable notched stops are secured to the rim of the wheel at the end of the travel for the top and bottom landings. In the case of overwinding or overspeeding in hoisting or lowering, or failure on the part of the engineer to slow down the engine at a safe distance from either of the landings, the pawl will engage with the notches of the stops or with the teeth of the wheel, thus causing the latter to rotate. It is emphasized that the movement of 1/16 in. on the rim of the wheel trips a weighted lever, which in turn shuts off the throttle, sets the brakes and performs any other operation that may be found necessary to bring the engine to a stop without dangerous shock or jar. After the controller has performed its functions the weight is again raised into place and latched.

The controller, it is explained, does not take the levers from the hands of the engineer unexpectedly, as an alarm is sounded to notify the engineer of overspeeding or of running beyond the safety point. The controller may, of course, be used with those driven by electric motors.



Overtravel and Overspeeding of Mine Hoists Are Prevented by a Controller for Hoisting Engines Which Automatically Closes the Throttle and Applies the Brake



The Ratchet Wheel and the Tripping Pawls Which Operate the Controller

Tin-Plate Export Regulations

WASHINGTON, Oct. 30.—In response to inquiries concerning applications for license to export tin plate, the War Trade Board, upon recommendation of its bureau of imports and of the committee on the conservation of tin plate, has made the following announcement:

1. That no licenses will be granted for the exportation of tin plate for use for any other purpose than as food containers, except on satisfactory evidence that the plate will be used in such a way as to contribute to the military needs of the nations at war with Germany and her allies.

2. That, as to applications for license to export tin plate to be used as food containers, preference will be given to those cases in which satisfactory evidence is presented that the food to be packed will be for the use of the nations at war with Germany and her allies.

Shop Dividends Due to Personnel Work*

Accident Prevention, Welfare Work, Education and Other Sociological Activities Have a Direct Relation to High Production and Low Costs

BY THOMAS T. READ†

PERSONNEL work covers the great variety of activities in industrial work that deal with the with the human factor. Individual phases of personnel work are accident prevention, sanitation, welfare work, reducing labor turnover, and so on. These are inter-related. Thus high labor turnover is one of the most important causes of a high accident rate, and unsatisfactory housing conditions are an important cause of labor turnover.

It must be kept in mind, as a major premise of this discussion, that through the rapid increase of invested capital in recent years and the much slower increase of labor supply most corporations have already passed over from the position of buying labor to selling employment. Without going into details it is my purpose to discuss briefly what has been and is being done and some results so far attained.

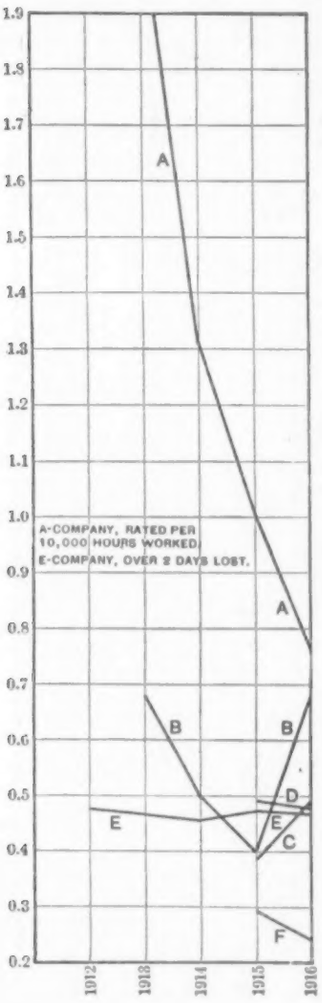


Fig. 1—Lost-time accidents of seven companies

Accident Prevention

Accidents are a source of loss in industry for four reasons: 1. The injured man and his fellows who come to his assistance lose time from their work, and machinery is often shut down, thus interfering with production. 2. The employer, in nearly all States, is obliged to provide medical aid for the injured man and, if the injury causes more than a brief loss of working time, to pay wage compensation as well. 3. While the man is out someone must be hired to take his place, thus decreasing efficiency, increasing the labor turnover and increasing the accident hazard by the employment of a new man. If there are many accidents in a given plant, employment there is less desirable, and the workmen are less efficient, since the fear of injury hampers their work.

There are two classes of methods of accident prevention, mechanical and psychological. The former endeavors to remove accident hazards, the latter aims to teach the men to avoid them. The psychological may be subdivided into two classes which may perhaps be designated as amateur and professional, since the question of money reward is the distinguishing feature. In the former the emphasis is placed upon the use of posters, voluntary committees, public gatherings, moral exhortation, etc., and in the latter the chief reliance is placed upon some form of reward, either money or prizes, to the foreman of a gang, or preferably to the men themselves, for decrease in the accident rate. The first method is the one more commonly used, and it is important to discover, if possible, which is the better.

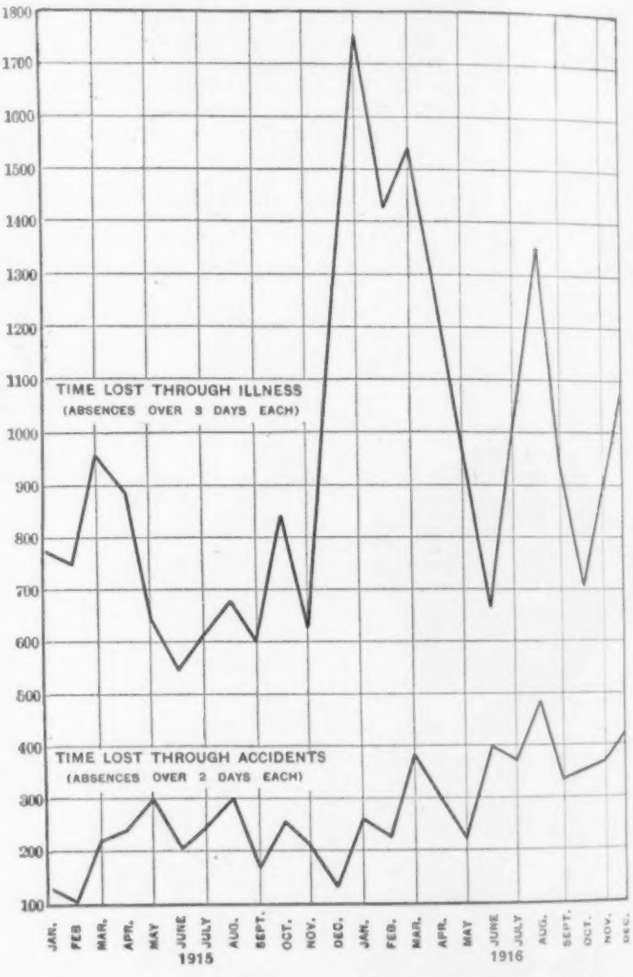


Fig. 2—Illness has a much more serious effect on the attendance at the plant than accidents

In the accompanying diagram are plotted the records of seven companies. These are all "lost-time" accidents, minor injuries not being included. All the records are plotted on the basis of 1000 shifts worked, with the exception of company A, which keeps its records on the basis of 10,000 hr. worked. Most of the other companies work chiefly 8-hr. shifts but make no allowance for overtime, so that the discrepancy is probably not very important. The number of hours worked is, of course, the only exact basis upon which to make comparisons of accident records.

Companies C D E and F use the amateur method of accident prevention, but F has recently supple-

*From a paper read at the St. Louis meeting of the American Institute of Mining Engineers.

†Technical department, New Jersey Zinc Co.

mented this by the use of prizes. Company E may be taken as typical of the group. It began work with a qualified safety inspector in 1912 and now has a safety inspector, an assistant safety inspector, a clerical assistant, and an experienced man to train first-aid teams. Safety suggestion boxes and bulletin boards for safety bulletins are used, occasional lectures and moving pictures are given, weekly plant inspections are made, all accidents are investigated, the plant men are put through a safety class, and there are more or less active safety committees in the different departments of the works. Many thousands of dollars have been spent for safeguards to machinery and other dangerous places about the works, and yet in spite of all this no appreciable change has been made in the accident rate. A further study of their recent accident records disclosed that of all their accidents (both minor and lost-time) 75 per cent were due to the workman doing the work in an improper manner, taking unnecessary risks, or exhibiting simple carelessness. Of the remaining 25 per cent nearly all, 22½ per cent, were classified as unpreventable; these were mostly minor accidents that a reasonable amount of care on the part of the workman would not have enabled him to foresee or prevent. In only 2½ per cent of the cases was the accident due to any lack of safeguards, dangerous conditions about the works. This is confirmed by Fig. 3, in which the total accidents in 1915 and 1916 are plotted by months in comparison with the number of men working on jobs that are new to them. The upper line shows the number of new men hired plus the men who have been transferred from one kind of work to another. The close parallelism between the two curves, besides showing that green men increase the accident rate, indicates that the most important factor in accident prevention is the man himself.

Company A, Fig. 1, is a mine at which the officials decided, on beginning safety work, that it was impracticable to employ safeguards and determined to rely almost wholly on the foremen and men themselves. A series of prizes was therefore offered, large enough to be worth working for, at first to the foremen and men, to the gangs who showed the greatest progress in accident reduction over monthly, half-yearly, and yearly periods. A small reward, handed over by the superintendent himself with a word of commendation, seems to produce the best results.

My personal opinion is that the first method has in many plants been carried quite far enough or even overdone. Not a few guards are almost as dangerous as the conditions they are supposed to remedy. I do not decry the use of suitable safeguards; they would be necessary even if for no other purpose than to demonstrate to the men that the company is sincere in its efforts to decrease the accident rate. But even those who insist most strongly on mechanical safeguards admit that they cannot be relied upon to prevent more than one-third of the accidents.

Illness Prevention

Fig. 2 shows the relative importance of accidents and illness as a source of lost time in industry, the figures being those of one company that has good medical supervision. It appears that the time lost from illness is, in the case of this company, four times as great as that due to accidents. As in the case of accidents, when the man is absent another man must be supplied to take his place, and this both increases the labor turnover and the accident rate; in other words, it is a source of considerable loss to the company as well as to the man himself.

Almost every company nowadays has some provision for medical supervision of its personnel, and in many instances the equipment provided is quite elaborate. In practically every instance, however, this is only employed to take care of the man who is injured in the course of duty, and it is a common practice for the plant hospital to send men to their family physicians, after giving them any immediate attention they may require. The result, of course, is that in many cases they go home and apply home treatment, if any at all, and a case that might have been cured in a day or two results in a protracted absence from work.

Fig. 3—The number of new men on the job has a direct relation to the number of accidents

It is clear that a corporation is justified in doing anything that is legal and tends to the improvement of its business, and it is equally clear that the preventing of illness among its workers does tend toward the improvement of its business. I look forward confidently to the day when the medical departments of large corporations will not only render medical attention to injured men but will give them any other medical attention they may require.

Labor Turnover

The system of having all hiring and discharging of men done by an employment manager has now been adopted by a number of corporations, with most satisfactory results. One concern, of only modest size, reports that through the use of an employment department the company, in the first year, decreased its labor turnover 48 per cent., decreased the hours worked 9 per cent. along with a 10 per cent increase in output, introduced a bonus system for regular work that cut down its lost time, remedied unsatisfactory conditions that had previously been undetected in a number of departments, and has done away with strikes and wage disputes.

The sources of the cost of hiring men are: 1. The cost of hiring the man, interviewing him, making a medical examination, placing him on the pay roll, sending him to his foreman, and getting him assigned to work. 2. The difference between the standard amount of work and that which he does while getting used to his job. 3. The extra materials which a new man spoils. 4. The extra supervision required by a green man. 5. Interference with the work of fellow-workmen. 6. Accidents caused by the green man. Various executives have computed the total amount of these costs for their own conditions and the results range from $25 to $100 as the cost to a company of bringing a green man up to the stage of a productive workman. To this must be added the cost of those men who work only for a short time and then leave. In most cases the number of men who must be hired in order to keep a working force at normal strength varies from 100 to 200 per cent. It is evident, therefore, that the costs involved are enormous, and no phase of personnel work will better repay study than this.

The most important and effective method is the creation of an employment department under a capable manager. Such a man should rank as an assistant superintendent if he is to perform his work effectively. The fields of accident prevention and labor turnover are so closely connected that it is desirable that both should be under the supervision of one man. The other methods of reducing the labor turnover may best be discussed under welfare work, since the primary pur-

pose of such work is to bring about conditions that will induce men to remain in the employ of the company, and thus cut down labor turnover.

Welfare Work

The primary purpose of welfare work is to decrease labor turnover. It may be an effort of the company to provide for the men as a whole comforts and conveniences that they could not individually provide for themselves except at a prohibitive cost. The other alternative is the paying an abnormally high wage rate. The latter is much the simpler and easier way, but it is hard to justify it from the standpoint of political economy. It is obviously better, from the standpoint of society, for a company that is selling employment to offer a man in return for his labor a combination wage made up of the most desirable proportion of cash, which he expends as he desires, and "kind," which in this case consists of those things which the company can provide to better advantage and at less expense. The necessity for such work is not always evident in industry, for manufacturing plants are, or were in former years, commonly established in the neighborhood of large cities, where the employee is expected, and usually prefers, to provide for himself. The company store, for example, in itself a desirable institution, was so grossly abused that it has become discredited.

Recently it has become the fashion in starting large new enterprises to build industrial towns *de novo*. This insures freedom from the complexities of local politics and permits the organization to choose the conditions under which it will operate, instead of attempting to adjust itself to conditions already existing, as well as to secure the necessary real estate at a reasonable cost. Unfortunately, the management of some companies has not been intelligent enough to perceive that to continue control over such public utilities as must be provided beyond the stage in which it is essential, is an unwarranted interference with the functions of public government that is certain to produce trouble in time.

The statistics of those companies that keep adequate records show that the chief element in labor turnover is furnished by the men without families who board. In an industrial town where good homes are available at a reasonable rent, good schools, well-kept streets, adequate stores that sell supplies at reasonable prices, and where the general tone of the community is good, steady workmen with families will be glad to make their permanent homes. The company is therefore able to buy productive labor at less cost to itself and can afford to invest capital to bring about so desirable a condition just as it invests capital to lower its other operating costs.

The cost of maintaining a roof over his family's head is the largest single item in the expenditures of a man of moderate means. It is evident that it is most desirable for the employee to own his own house. This is not now difficult for a man who is regularly employed, since there are reputable firms that will not only sell building material on credit to the owner of a lot, but will actually loan him enough money to pay the major part of the cost of construction. On this basis it would be profitable for a company that owns sufficient land to give to a steady employee a deed to a lot, with the proviso that he must build upon it a house to cost over a fixed minimum sum within a reasonable length of time. No additional capital investment is thus required of the company, and its return on the original capital invested in the land comes back to it in a decrease in the tax rate through the increase in the taxable valuation of the town. If all the houses in an industrial town have to be built by the company, the amount of capital thus tied up is enormous, returns on the capital are slow, and there is a possibility of an enormous shrinkage of values if for any reason the venture is not a success. Not the least advantage of such a plan is that it would do away with the undesirable uniformity of industrial towns, where a man can secure any number of houses renting at $8 or $12 a month, all alike, but cannot find any houses renting at $20 or $30 a month. It is so obviously to the company's advantage to have its foremen and subforemen well housed that this phase of the problem is worthy of the most careful study, and if the man who has charge of personnel work is not in charge of housing he should at least be constantly consulted regarding it.

Unless the workmen are provided with clean, commodious, and well-designed change houses, ample toilet and bathing facilities in connection with their work, it seems idle to attempt through welfare workers to raise the standard of living in the homes. Toilet facilities should be of the modern type that do not lend themselves to the transmission of disease. It is important that such conveniences shall be well built and well kept. Keeping such facilities in good condition requires plenty of hot water, scouring soap and elbow grease, and the man in charge should be vigorous enough to apply all of these effectively.

The schools of a community may be below grade and the company may wish to improve them. This can best be done through the instrumentality of sagacious employees who act in their private capacity as citizens. Social work, where it is done, is commonly in the hands of trained welfare workers. The kindergarten is an excellent means of introduction to the homes of the parents, and the Boy Scouts and Camp Fire Girls organizations are similarly useful among the older children.

Religious affairs are particularly difficult because religion is a matter of sentiment rather than reason and is therefore not open to logical analysis. The best thing to do is to leave religious matters alone, but unfortunately they will not leave industry alone. Religious festivals frequently interrupt the work of a plant for days at a time, quarrels in a church organization frequently interfere seriously with the attention of workmen to their work, and differences in religion often lead to friction between the members of a gang of workmen. A difficult situation should not be further complicated by permitting a person of a strongly religious turn of mind to engage in personnel work.

Teaching of English to foreigners is popular just now and there is a good deal of weight behind this desirable movement. Some concerns have well-organized schools for training the workman before letting him loose on the plant; one concern puts an experienced man in charge of a gang of new men and rates his pay upon the output of the gang. The apprentice system is good wherever conditions are suitable for its use. It is obvious that any education of the workman improves his efficiency and benefits his employer unless the education is so badly directed as to make him discontented with his work and to want to get into a "white collar" job. When, as now, a bricklayer can earn more money than a college graduate, it is curious that this desire for "white collar" jobs should exist, but it does and it needs to be reckoned with in directing educational work.

Conclusion

Labor has become the largest cost factor in productive industry and seems likely to continue its relative increase. The ideal of industry is a laborer who is sober, efficient and steady. The first is in progress of attainment by the advance of prohibition of the liquor traffic. Efficiency in the workman is attained through better management and training of the worker. Lost time is overcome by the prevention of accidents and illness, and through a great variety of means that bear indirectly, as indicated above, on the labor supply. Industrial accident prevention looms large in the public eye through the recent enactment of compensation laws, but as a source of lost time to the plant and lost wage to the worker it is much less important than illness. Health insurance is now being urged in many quarters, and if it comes about we may expect a transfer of emphasis from accident to illness prevention. Lost time through religious holidays and other personal activities, or inactivities, of the worker is much more important than either; their relative values being something like 1, 4 and 10 in most cases. The only practicable means of dealing with the latter seems to be the offering of a bonus, over and above wages, to the workmen who lose no time each month. The underlying purpose of personnel work is to conserve the labor supply and decrease the net cost of productive labor.

Spelter Statistics for 1917

Figures compiled by the U. S. Geological Survey from reports submitted by all zinc smelters operating during the first six months of 1917 show that the production of spelter from domestic ore in that period was 311,539 net tons and from foreign ore 49,599 tons, a total production of 361,138 tons, compared with 351,004 tons for the last half of 1916 and 316,452 tons for the first half.

The output of spelter by Illinois smelters increased about 4000 tons for the 6 month period and that of Oklahoma over 14,000 tons, but the production of Kansas fell off nearly 25,000 tons as a result of the declining price of spelter combined with the high cost of natural gas and other fuel. The remaining spelter producing States made a large gain, especially Pennsylvania. The output of primary electrolytic spelter also advanced.

The stocks of spelter held at smelters on June 30, 1917, amounted to 33,147 tons against 17,598 tons at the beginning of the year and 23,879 tons at the middle f 1916. This shows some gain in stocks since the beginning of the year, yet the total stocks are small if distributed between the more than 70 plants, including regular smelters, refining and electrolytic plants. The average smelter usually carries several hundred tons of spelter, including working stock on hand and spelter in transit and in agent's hands.

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 221,434 tons, as compared with 229,342 tons for the last half of 1916 and with 229,086 tons for the first half. This was not altogether normal domestic consumption, however, for it must include the zinc content of the exports of brass which were largely increased during the first half of the present year. The value of exports of articles made from brass, however, fell off decidedly, but this was due in part to the lower price of spelter.

The exports of spelter of domestic origin were 93,000 tons, against 105,130 tons in the last half of 1916 and 58,007 tons in the first half.

The number of retorts at zinc smelters at the close of 1916 was 219,418, and there were then building or planned 13,632 additional retorts, a total of 233,050. The number at smelters June 30, 1917, was 232,202, and about 15,000 additional retorts were building or planned, a total of over 247,000 retorts.

Owing to the low price of spelter at the close of the first half of 1917, many smelters were idle, either wholly or in part. More than 35,000 retorts were idle June 30, 1917, and this number does not include retorts engaged in refining prime western spelter or in redistilling zinc ashes and skimmings. Fourteen plants were wholly idle.

Pneumatic Ash and Flue Dust Plant

A pneumatic ash-handling plant installed by Ed. Bennis & Co., Ltd., Little Hulton, England, and described in *The Engineer*, London, has an auxiliary conveyor pipe for removing flue dust and soot from the flues, economizers, and chimneys entirely separate from the ash pipe, but joined to it at its foot leading up to the ash tank. The dust pipe main is provided with connections, to which may be attached lengths of flexible pipes, which can be taken about as desired and inserted into openings in the flues and economizer chambers, which are provided with cover plates for use when the dust is not being removed. Also a hand hole with an air-tight door, is located at each end of every bend of the ash pipe for removing any obstructions, which may accidentally become lodged in the pipes.

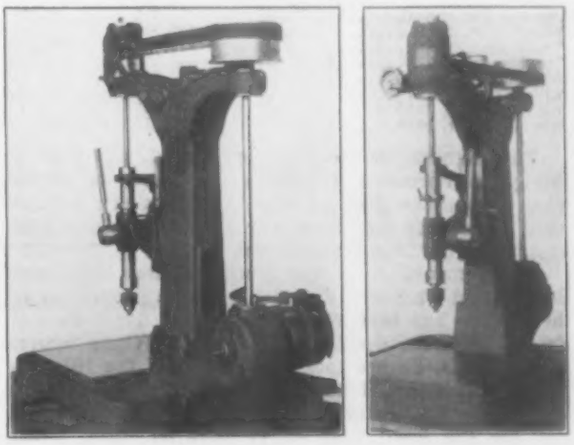
The National Steel Products Co., Bessemer, Ala., recently organized, is planning for the early establishment of a local plant. Bids have been received for the principal equipment for a works with initial capacity of about 15 tons of steel castings per day. A 3-ton open-hearth furnace will be installed. J. V. Calvin is secretary.

Interesting Sensitive Drilling Machine

The Detroit Tool Co., Detroit, has developed a line of high-speed sensitive drilling machines of the single-spindle type. Both bench and floor styles are made, the former being the one illustrated. The quarter-turn driving belt is eliminated and the belt shifter is located in a convenient position for the operator.

From tight and loose pulleys at the back of the machine, power is transmitted through rawhide and steel bevel gears incased in a gearbox to a vertical shaft having a single-diameter aluminum pulley at the top. A straight belt with an idler pulley to provide the proper amount of tension passes from here to a two-step aluminum pulley at the top of the spindle. The idler pulley which is provided to secure the proper tension is operated by a handwheel, screw and idler lever. This arrangement, it is emphasized, gives more belt contact on the spindle pulley on the slow speed with its required increase in belt torque, without sacrificing the arc of contact on the driving pulley.

The belt shifter is located on the same side of the machine as the hand lever. Frequently, it is pointed out, in a belt-driven drilling machine the operator will exert sufficient pressure on the drill when it breaks through to stop the spindle and cause the belt to slip.



Bevel Gears and a Vertical Shaft Have Eliminated the Quarter-Turn Belt for Driving a Sensitive Drilling Machine

This necessitates shifting the belt, backing up the spindle and starting the machine again. With the arrangement provided in this new machine, all that has to be done is to remove the hand from the feed lever and take hold of a knob located on the belt shifter about 1 ft. above the feed lever. This enables the belt to be shifted from the larger step of the spindle driving cone pulley to the smaller one just above. It is then possible to back the spindle clear of the burr at the bottom of the hole and by pulling down on the knob the spindle is started forward again. This, it is emphasized, requires only about 1 sec., and the operator does not have to touch the belt, and in addition one hand can remain on the work or jig.

The tables of both machines have been made large to permit the use of big jigs as well as providing space for piling up stock for quick handling when it is found desirable. The spindles, it is stated, may be operated at a speed of 8000 r.p.m. Ball bearings with dust caps and special oiling arrangements are used for the revolving parts.

Washington Office for Youngstown Sheet & Tube Co.

In addition to its district sales offices now located at New York, Boston, Philadelphia, Pittsburgh, Chicago, St. Louis, Denver, San Francisco, Seattle, Dallas, Atlanta and Detroit, the Youngstown Sheet & Tube Co. has opened a branch in the Munsey Building, Washington, D. C. This office will be in charge of W. B. Blowers, district sales agent, assisted by H. E. Richardson, who has been transferred from the Philadelphia office and who will reside in Washington.

Tremendous Exports of Steel to Europe's Warring Nations

Exports of munition steel from the United States, as represented by crude steel and steel bars, have reached astounding figures.

Exports of Crude or Semi-Finished Steel

Crude steel exports have attained proportions that are nearly staggering. For the fiscal year ended June 30, 1917, the outgo of billets, ingots and blooms was 1,936,252 gross tons. This compares with 220,416 tons for the year ended June 30, 1915, and with 962,097 tons on June 30, 1916. For the first six months of 1917, the total has been 1,031,191 tons or 171,865 tons per month. The following table shows the exports of this important product as well as the destination where possible:

Exports of Steel Billets, Ingots and Blooms from the United States in Gross Tons

1917	Total	To Great Britain	To France
January	183,656	50,083	85,966
February	131,566	30,579	68,910
March	193,469	61,239	65,685
April	162,209	65,404	57,052
May	168,158	52,578	55,234
June	192,133	56,671	44,346
Totals	1,031,191	316,554	377,193
Average per month	171,865	52,759	62,865
Fiscal year, 1915	220,416	198,919	.....
Fiscal year, 1916	962,097	240,802	576,109
Fiscal year, 1917	1,936,252	540,174	829,486
Calendar year, 1913	91,847	51,013	.....
Calendar year, 1914	50,496	35,291	.....
Calendar year, 1915	560,704	359,125	.....
Calendar year, 1916	1,508,727	289,414	902,499

The increase for the fiscal year ended with June 30 this year represents a growth in exports of double what it was the year previous and of about 9 times what it was for the same year in 1915. Taking 1913 as normal, the 1916 increase was 15 fold.

The comparison of the amounts taken by Great Britain and France is interesting. The proportion of the former has been steadily declining while that of France has been decidedly expanding. Where figures are available, France took 60 per cent of the 1916 exports while Great Britain took less than 20 per cent; whereas in 1915 Britain took 65 per cent of the total. But for the fiscal year ended June 30, 1917, Great Britain took about 28 per cent of the total while France absorbed about 43 per cent. But the table also shows that as late as June Great Britain was taking large quantities of raw steel, even more than France.

Taking the July and August statistics, the latest published, we find the following exports of crude steel:

	Total	To Great Britain	To France
July, 1917	112,085	17,807	43,066
August	189,083	....	....

The average is less than that maintained in the first six months, but the total in August is nearly equal to the best month in the first half. The total to Sept. 1, 1917, has been 1,332,359 tons comparing with 888,565 to Sept. 1, 1916.

Nearly 3,500,000 tons of semi-finished steel has been exported from the United States in the 32 months from Jan. 1, 1915, to Sept. 1, 1917, or over 100,000 tons per month. Before the war these exports were less than 6000 tons per month.

Steel Bar Exports

Exports of steel bars have continued to expand as the war has progressed until to-day they exceed the records of any other country at any time. For the fiscal year ended June 30, 1917, they had reached practically 750,000 tons and at the end of the first six months of this year steel bars were being sent out at the rate of 57,049 tons per month. The scope of this expansion is given by the table at the bottom of the preceding column.

For 1916 the exports of this one product—774,455 tons—were not far from four times the former pre-war record of 211,716 in 1913.

Since June these exports have declined to some extent due to Government regulation but this is probably only temporary. For July they were 32,009 tons and for August, 48,810 tons, bringing the total to Sept. 1, 1917, to 423,216 tons or 52,902 tons per month.

Exports of Steel Bars from the United States in Gross Tons

1917	Total	1917	Total
January	57,359	April	73,228
February	44,544	May	62,541
March	52,367	June	52,258

Total to July 1, 1917	342,297 or 57,049 per month
Fiscal year ended June 30, 1915	230,274 or 19,189 per month
Fiscal year ended June 30, 1916	634,514 or 52,876 per month
Fiscal year ended June 30, 1917	749,106 or 62,425 per month
Calendar year, 1913	211,716 or 17,643 per month
Calendar year, 1914	123,009 or 10,250 per month
Calendar year, 1915	425,677 or 35,473 per month
Calendar year, 1916	774,455 or 64,538 per month

Campaign to Reduce Waste of Gasoline Inaugurated

A campaign against the wasting of gasoline has been inaugurated by the American Automobile Association, the Motor and Accessory Manufacturers, the Society of Automotive Engineers, the Petroleum Division of the United States Bureau of Mines and the Council of National Defense. It is estimated by the Bureau of Mines that the daily consumption of gasoline by the army, navy and aircraft operations in the coming year will be 959,000 gal., while production this year is at the rate of 6,849,000 gal. per day. Approximately 4,800,000 gal. of this is used by motor cars and trucks and the remainder serves as fuel in motor boats and stationary internal combustion engines and is employed in various industries. It is estimated that a total of 1,500,000 gal. is wasted daily in various ways. If care is taken by the owners of the 4,200,000 motor vehicles and the 25,500 garages of this country, it will easily be possible to take care of the nation's war needs, as these are less than two-thirds of what is now wasted.

Magnetic Separator in Coal Pulverizing Plant

Pulverized fuel has been substituted for natural gas for firing the water-tube boilers in the shops of the Missouri, Kansas & Texas Railroad at Parsons, Kan. The plant is designed to handle either run of mine or slack coal which is dumped from cars into a concrete track hopper adjoining the separate building containing the equipment for pulverizing and drying the fuel. A set of rolls designed to reduce the coal to cubes having a maximum length of 5 in. in a single operation is located underneath the track hopper and after passing through the crushing rolls the coal drops on a belt conveyor, the upper end of which passes over a magnetic separator pulley built by the Cutler-Hammer Mfg. Co., Milwaukee, Wis. Stray pieces of iron or steel are removed in this way from the coal which is delivered to a set of corrugated crushing rolls, the output of which will pass through a ¾-in. mesh screen.

Carbohydrates As a Steel Deoxidizer

A new method of deoxidizing steel in the furnace bath has been suggested by a German patent issued in this country (U. S. 1,238,409) to Adolph Klinkenberg, of Dortmund, Germany. It is based on the addition of carbohydrates. Claim is made for complete deoxidation with only traces of carbon entering bath. A special advantage is found in the production of a very soft iron. The purer the carbohydrate, the better the results obtained. Sugar, starch and cellulose are used with the best effect, though wood and herbaceous plants such as leather have been used with success, it is claimed. When sugar or starch are used, 2.5 kg. are sufficient to completely deoxidize 1000 kg. of steel. With wood shavings 4 to 5 kg. are necessary. Desulphurization also is claimed to be accomplished by this process.

At a conference of truck owners held at the Hotel Statler, Detroit, it was decided that a national uniform system of costs should be adopted. One developed by S. S. Merithew, truck sales department, Packard Motor Car Co., was selected as the basis.

Expansion of Davis-Bournonville Co.

The Davis-Bournonville Co., Jersey City, N. J., has purchased the factory and grounds of the H. G. Kotten Co. located opposite its general offices and factory. The Kotten building will be used for the manufacture of electrolytic oxygen apparatus and accessories, which in turn will release considerable space in the company's recently completed building for the production of oxy-acetylene welding and cutting apparatus. It is planned to erect a four-story brick and mill construction warehouse, 60 x 100 ft., on the Kotten property and sufficient space will still be left for a five-story factory, 60 x 150 ft., which may be built in 1918.

The plant and factory of the Davis Acetylene Co. at Elkhart, Ind., has also been taken over. The construction of acetylene lighting generators and accessories will be discontinued and the manufacture of special products and acetylene pressure generators for the oxy-acetylene process will be commenced. The Davis Acetylene Co. has been dissolved and the factory at Niagara Falls, Ont., which the two companies occupied jointly, has also been taken over and will be used for manufacture of oxy-acetylene apparatus for the Canadian trade exclusively.

A sales office has been opened in the Colorado Building, Washington, in charge of Henry R. Swartley, Jr. This office was established to facilitate sales of oxy-acetylene welding and cutting apparatus and oxygen and hydrogen producing apparatus to the Government for use in the army and navy.

Holland Plans to Have Its Own Steel Plants

The utter dependence of Holland upon foreign countries during the war for the supply of means necessary for her defense has brought the country face to face with the necessity of placing it on a practical basis so far as its supply of iron and steel is concerned. According to a Dutch technical paper, a meeting of leading persons in the industrial and banking world was called recently at The Hague by Dr. Lely, Minister of Water Engineering, to discuss the erection, with the assistance of the Treasury, of blast furnaces and rolling mills in Holland. The cost of the scheme is estimated at over $10,000,000. The result of the discussion is not yet known, but it is thought that the proposals have a fair chance of being adopted. The old argument that iron and steel could not be produced in Holland as cheaply as the raw materials could be imported, especially from Germany, has lost much of its force.

According to *L'Echo des Mines*, Paris, a company has been formed at Rotterdam for the construction of a blast furnace and steel plant at the Hook of Holland. The share capital, about $5,400,000, has been subscribed, the company being backed by one of the leading Rotterdam banks and by two Dutch shipping companies.

New Protective Tube for Thermocouples

As a substitute for the foreign product which was formerly imported, Charles Engelhard, 30 Church Street, New York, is offering a domestic protecting tube for pyrometer thermocouples. It is designed to protect the platinum wires used. While the fusing point of the body of the tube has not been accurately determined, it is stated to be above 3500 deg. Fahr., and the glaze of the tube while different from that on those formerly imported, has a softening point which is claimed to be more than 100 deg. C. higher. The glaze thus does not adhere to the outside protecting tube when heated above the softening point and then permitted to cool.

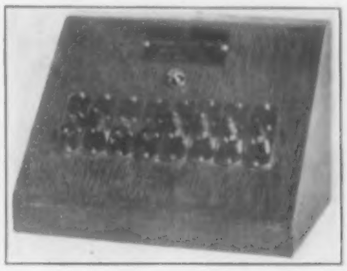
The record size plate mill being built for the Lukens Steel Co., Coatesville, Pa., by the United Engineering & Foundry Co., Pittsburgh, employs two relatively small middle rolls backed up by very large top and bottom rolls. The plate will be rolled back and forth between the two small middle rolls, this design being employed on account of the great width of plate handled. The roll bodies are 204 in. long.

Factory Calling and Fire Alarm Systems

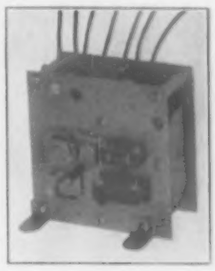
Two new electric specialties have recently been placed on the market by the Standard Electric Time Co., Springfield, Mass. These are equipment for fire alarm and calling systems for use in industrial establishments of all kinds. Both are fully electric in operation and employ the selector system.

The calling system, which is mounted in a wooden case that can be placed on a shelf by the telephone switchboard, employs eight keys, seven of which control the selector mechanism in a separate cabinet in a closet or other out-of-the-way location and a ringing key at the extreme right. All of the keys are of the type used in telephone central office switchboards and are therefore familiar to the operators. In use the keys required to secure the code number are pressed and the instrument started in operation by depressing the key at the extreme right which is red to distinguish it from the seven black selector keys. The system can be used with either battery voltage or alternating or direct current of 110 volts and as the signals are rung the code is flashed to the operator by a small tell-tale lamp located above the keys. The system being electric, the instrument does not require any crank or levers for hand winding.

The fire alarm system employs a master selector of simple construction which will ring any selected code three times or indefinitely as may be desired. Any type



The Combination of Rings in a New Factory Call System Is Secured by Manipulating the Selector Keys at the Left and Is Rung by Depressing the Red Key at the Extreme Right



The Fire Alarm System Is Designed for Use with Ordinary Fire Alarm Stations and Operates Any Kind of Signal

of signal such as vibrating or single stroke bells or horns can be employed, the system being designed for use with the standard break glass fire alarm stations or for push button operation. The instrument will operate from any battery capable of delivering 16 volts or more and can thus be employed in connection with the one operating the electric clock system.

The selector is similar for both equipments, the mechanism being operated by a spring that is wound by a powerful electric magnet operating through a rack and pinion. The arrangement of contacts, however, is different for the two systems, that for the calling instrument having a series of contacts which alternately bear against a revolving flat spring, while the fire alarm selector has a definite code actuated by teeth cut on the cam. An escape wheel and a weighted pendulum capable of adjustment for different ringing speeds provides the time element feature.

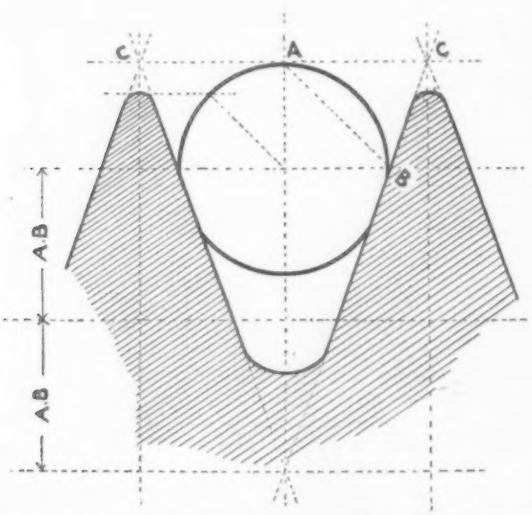
The Aborn Steel Co. is now occupying its new warehouse and office building at 22 Clarke Street, New York, where stocks of cold drawn and rolled steel products, shafting, drill rods, music wire, high-speed carbon tool and alloy steels, etc., will be carried. Branch offices are also maintained at Rochester, N. Y., and Philadelphia. J. T. Slingsby is president and treasurer; H. Ross Slingsby, vice-president; J. Ciegerich, secretary, and R. W. Pilger, assistant secretary.

E. P. Reichhelm & Co., Inc., 26 John Street, New York, representatives of the American Gas Furnace Co. and the American Swiss File & Tool Co., have purchased the six-story building in which their offices have been located for a number of years.

English Practice in Mill Rope Drives

Cotton Rope Preferable to Manila — Data on Sheaves, Velocities, Working Stresses, Etc.— Some Long-Life Installations—American Practice

IN a paper recently presented before the Engineers Society of Western Pennsylvania, J. Melville Alison, engineer, William Kenyon & Sons, Dukinfield, Manchester, England, discussed some salient features of English rope drives for power transmission and endeavored to demonstrate that cotton is a better material than manila for this purpose, also that much may



Design of Sheave Grooves for Ropes Over 1-In. Diameter. From the center of a circle of diameter equal to that of the rope a distance equal to twice the length of cord AB is measured downward on the vertical diameter. The point so determined is the apex of the inverted angle of the groove. The sides of this angle passing through the terminal points of the horizontal diameter midway between this point and the center of the circle form the center of the curve at the bottom of the groove

be gained by the application of scientific principles to rope construction and sheave design. A review of his paper together with some comments made in the discussion by Frank L. Egan, H. Koppers Co., Pittsburgh, follows:

Cotton ropes have supplanted all others for power transmission in England. These ropes are efficient and give long service. The longest life is of ropes which were installed in September, 1878, for 24-hr. day work and are still giving service, but it is common to find cotton ropes doing night and day duty for periods of 20 yr. and over. In rolling-mill practice up to 10 or more years of service is obtained for hot-roll work, and 15 or more in cold-roll tin plate mills. Although cotton costs more than manila, its superior resilience, grip and groove impact add so greatly to its driving capacity that up to one-third more horse-power may be transmitted, and this with the life of cotton rope approximately three times as long as that of manila rope will reduce apparently excessive first charges.

The use of three strands in making up a rope gives one which in construction is superior to that of four or any other number of strands. A rope wedged in its groove is preferable to a revolving one and will transmit more power and last longer. Also good sheave-groove design such as is illustrated does much to increase the driving capacity of the ropes.

Sheave diameters are important and while in England the minimum standard is taken as 30 times the diameter of the rope, in America 40 to 50 times is accepted. Here again cotton scores over manila, since its softness readily admits of superior bending properties.

As to the life of cotton ropes much, of course, depends on their size and the conditions under which they have to work. All things being equal, durability is determined by sectional area, and the most economical diameters range from 1½ in. to 1¾ in., more of the latter being used in England than any other size. For rolling-mill work, however, it so often becomes a matter of sheave widths that 2-in. ropes are generally used. A remarkable case of longevity may be mentioned of 24 cotton ropes 1¾ in. in diameter, employed to transmit 820 hp. in a Lancashire cotton mill and running at a velocity of 4396 ft. per minute directly from the engine flywheel, which is 28 ft. in diameter. These were fixed in September, 1878, and are still running in 24 hr. a day service, a period of over 38 yr. Another set has been working 28 yr. on an average of 20 hr. per day and appears little the worse for wear.

Short Drives and Over-Roping

By adding sufficient rope to make up any deficiency in contact, driving may be successfully accomplished when sheaves are almost touching. An illustrative case is of an engine in Scotland. Its spur gearing was removed and rope sheaves were fixed on the same centers, permitting only a clearance of 8 in. between sheave rims. A load of 360 hp. is easily transmitted by 16 ropes 1¾ in. in diameter. At a mill in the north of France the sheaves are so close that a finger would scarcely pass between them. At the present time a drive is being fitted for the Armstrong-Whitworth Co. of Canada, Montreal, in which the sheaves are 108 in. and 72 in. on a rolling-mill plant, with only 15-ft. centers and grooves for twelve 1¾-in. ropes. This drive is being fitted under a guarantee of maintenance from the rope maker, who originally was consulted on the scheme.

Over-roping certainly retards efficiency. The fault sometimes manifests itself by the slack changing with the pulling side, and at other times by the rope traveling across the grooves or even leaving the pulleys altogether. When such troubles arise it is best to remove one or several ropes if need be, without interfering with the splicings. Mr. Alison knows of instances where half the original number were taken off before satisfactory driving was obtained. This state of things frequently arises, even under fairly regular loads, when actual requirements come below the calculated power.

Rope Slack on Bottom

While it is generally accepted that the slack side of the drive should come on top, this position is not always obtainable, nor is it under all circumstances desirable. With an erratic or fluctuating load such as obtains in rolling-mill practice the slack should come on the bottom. The variable load of the mill tends to set up considerable oscillation in the ropes, and if the slack is above, may cause the ropes to ride or even jump off the sheaves. On the other hand, if the slack is below, any tendency of the rope to wander from its appointed track is held very largely in check by the pull on the tight side, also the weight of the rope will reduce the oscillations. If, however, ropes persist in wandering from their appointed track, a rope guard placed in comb fashion approximately 10 per cent off the centers away from the driven sheave should be used. In rolling-mill practice in England this is freely adopted.

Rope Velocity and Capacity

As affecting rope drives, many tables have been compiled showing a steady decrease of transmitted power for speeds exceeding 4800 ft. per minute, and indicating that ropes running at 7000 ft. per minute are capable of transmitting only half the load of the

same rope running at 4800 ft. per minute. While few cases of rope transmission exceed a velocity of 5000 ft. per minute, those of higher speeds totally disprove the theory of centrifugal detraction at the higher velocities. Drives in England and France are running at over 7000 ft. per minute, but all are out-done by a drive in Cleveland where the ropes are running at 7800 ft. per minute. The driving sheave is 14 ft. 4 in. in diameter, and is making 168 r.p.m. The driven sheave is 4 ft. 7 in. in diameter and fitted with 19 2-in. ropes to transmit approximately 1400 hp. The driven sheave is only 27½ times the diameter of the rope but is giving comparatively good service.

While an effective working tension of about 200 lb. per square inch of rope section may be used in calculations pertaining to three-strand cotton ropes this figure may, in some cases, be exceeded. This was well demonstrated in a large motor-driven sheet mill, which, when first installed, was driven by 26 ropes, 2 in. in diameter, and, to provide against a peak load of 1500 brake hp., was helped by the momentum of two heavy flywheels making 35 r.p.m. or a peripheral velocity of 3516 ft. per minute. Tests conducted under working conditions revealed a high rate of resistance, which diminished as the load rapidly advanced from 150 to 900 hp. This was considered due to over roping at the lower power. Six of the ropes were accordingly removed. Running with only 20 ropes lowered the average friction from 5.8 to less than 3 per cent brought about steadier transmission and materially improved the output.

English Cotton-Rope Installations

Examples of rolling-mill drives showing the life obtained from cotton rope in England follow:

An installation with which Mr. Alison was personally associated was fitted with 18 ropes 2 in. in diameter running on a driving sheave 10 ft. 6 in. in diameter making 110 r.p.m., and driving a sheave 30 ft. in diameter at 38.15 r.p.m. With this peripheral speed of 3636 ft. per minute the ropes were calculated to transmit 846 hp., allowing a fair margin of safety, and leaving a balance of 154 hp., or about 15 per cent, for a momentary peak load of 1000 hp. to be carried through by the momentum of the flywheel. This was on a six-stand hot-roll tin-plate mill. The ropes lasted seven years but underwent various hardships, such as standing in a flooded pit for two weeks, and were also subject to some very inferior take-up splicing.

Another hot sheet-mill drive employs 16 2-in. ropes to drive six stands. The engine is of the uniflow type with driving sheave 8 ft. in diameter running at about 145 r.p.m. and a mill sheave 36 ft. in diameter and weighing 150 tons, making about 33 r.p.m. While this drive has given fairly good rope life, in that the present ropes are on as installed in September, 1910, the over run of the heavy mill wheel appears to cause a very heavy lashing of the ropes at starting and stopping.

A rope-driven wire-drawing mill at William Cooke's Mills in Sheffield has proved successful. The rope speed is about 5000 ft. per minute with 1¾-in. ropes driving forward to two lines of rolls, with the engine shaft taking the other. About two years ago Mr. Alison inspected the drives, the engineer being afraid one set of ropes was giving way. The drive was doing splendidly in spite of seven years continuous night and day service. The ropes on one drive were slack enough to be taken up, and this he advised, but the engineer explained that the company was on urgent war orders and could not afford to stop. It was decided, therefore, that a spare lot be ordered immediately. However, the engineer had trouble before this arrived. He could have had splicers at once and they would have obviated any stoppage. So far as Mr. Alison knows these ropes have not been fitted.

American Practice

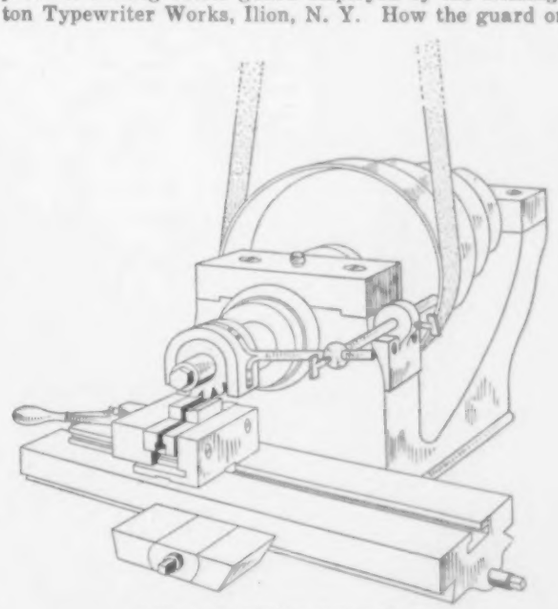
Frank L. Egan, H. Koppers Co., Pittsburgh, participating in the discussion indicated his interest in the statement made by Mr. Alison that the power transmitted actually increases up to a speed of 7000 ft. per minute. American engineers, he believes, consider 5000 ft. per minute as a good average for economy, taking into account cost of rope and drive complete and also upkeep on the entire drive.

His company has a drive, installed nine years ago which uses rope 1⅛ in. in diameter, running continuous over the driver and four driven shafts at different angles and transmitting 200 hp. at about 5000 ft. per minute. It has 2100 ft. of rope and two tension carriages. This rope averages about one year in 24-hr. service and does not show any external wear. The inside of the rope chafes to a fine powder so that it will shake out as dust when the strands are opened. This drive would pay if the rope life were only three months.

Another drive was installed about 15 years ago to transmit approximately 2000 hp. from a cross-compound engine to four line shafts for driving electric light and power generators. One continuous rope 1¾ in. in diameter was used to each line shaft, or four in all. Service was about 18 hr. a day. This drive was so successful that it continued in service 11 years with the original four ropes. They were spliced twice to his knowledge, perhaps more. Manila ropes of high quality were used. It was still capable of good service when discarded.

Adjustable Milling Cutter Guard

The accompanying illustration shows a form of adjustable milling cutter guard employed by the Remington Typewriter Works, Ilion, N. Y. How the guard or



Adjustable Milling Cutter Guard

hood may be removed is indicated as well as the adjustment which may be made in a direction parallel to the arbor.

New German High-Speed Steel

A new high-speed steel has been patented by a German company, the Stahlwerke Richard Lindenburg of Remscheid. The patent specification states that the steel shall contain carbon, 1.2 per cent; manganese, 1.2 per cent; silicon, from 0.1 to 0.3 per cent; chromium, from 3 to 10 per cent, and cobalt, 1.5 per cent. This material is said by the inventor to be an improvement upon a similar steel which he patented last year containing molybdenum. In the manufacture of the new steel the molybdenum is omitted and the percentage of manganese and chromium increased.

Over 500 employees of the Bethlehem Steel Co., South Bethlehem, Pa., have taken advantage of the offer made by the company through the Bethlehem Securities Co. to loan second-mortgage funds to build or purchase homes. The company has now made loans for such purpose to employees totaling about $1,700,000.

J. M. Betton, sand blast machines and accessories, has moved from his former location at 26 Park Place, New York, to 59 Pearl Street.

PLASTIC METAL DEFORMATION

Bibliography of Literature on Extrusion, Rolling, Punching, Shearing and Other Processes

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The Stanley Works' Employees are Doing Their Bit

More than 100 employees of the Stanley Works, New Britain, Conn., have left their positions to fight for Uncle Sam. They have gone with the National Guard, Officers' Reserve Camps, the New National Army, Navy, Ambulance Corps, and some, who for physical reasons were not accepted in other divisions, have entered the Government Munition Inspection Service. Those employees who still remain at their regular work are doing everything that they can to back up the soldiers. Under the auspices of the Stanley Club, a weekly letter on office and factory happenings is being sent to each former employee now in the Government service. Recently an entertainment was given for a fund to buy tobacco for Stanley Works' soldiers.

An average of 100 girls employed in the office do Red Cross work one evening a week. They do this work in the office and the company supplies them with supper. A fund has just been raised among the employees of the Stanley Works to purchase a complete ambulance equipment and present it to the Government, and one of the men now working in the cold rolled steel mill has volunteered to drive it.

For both the first and second Liberty loans the company has sold bonds to its employees for weekly payments extending over a year. On this basis over $100,000 worth of bonds was subscribed to for each loan, or an average of about $40 worth of bonds for each employee.

Shipments are being made by the William B. Pollock Co., of Youngstown, Ohio, of the steel work for blast furnaces for the Tata Iron & Steel Co., of Sachki, India. Regular shipments will be made from time to time during the next month or two. The first shipment was loaded last week and consisted of about three carloads. It was consigned to New York, from which point it was transferred to boat, and will be taken to India by way of the Panama Canal. The Pollock company has a contract for three furnaces, which are nearing completion and will be sent to India as soon as possible.

CORRESPONDENCE

A Why for Government's Labor Shortage

To the Editor: Noting the announcement in the Oct. 18 issue of THE IRON AGE, "Workmen Badly Needed," the writer wishes to call attention to some obstacles which prevent the Government's securing enough efficient labor to carry on the war industries. It is a known fact that there are many thousand engineers, carpenters, mechanics, etc., now engaged in other occupations, and in case of the present emergency would be glad to set aside their personal interest and enlist in Government service, if it were not for the fact that several branches of the Civil Service Commission have an established form of application which many of the most competent workmen cannot answer to in full.

One instance may be cited. A mechanical engineer of proved ability and reliability applied for a position as mechanical engineer in experimental work, in answer to the call published in THE IRON AGE of Sept. 6. The application was executed on the form furnished by the local board of examiners and mailed to the proper officials. After a few days the application was returned for correction, the only correction desired being that the application be made on another form. The applicant at once proceeded to make the required change, but found one question in the vouchers that no acquaintance could positively answer; in fact, the question could not be answered absolutely for anyone applying. Therefore the matter was dropped by the applicant.

In a national emergency the application form should be as concise as possible, so that prospective employees will not be embarrassed by a multitude of unnecessary questions and the uncertainty of getting a job. An authentic medical certificate, together with reliable vouchers as to reliability, theoretical and practical knowledge of the applicant, is all that should be required. With a slight modification in forms and system of employment, our Government should be able to secure all the skilled labor necessary for the prosecution of this war.

SAMUEL H. KENNEDY.

Tunnel Hill, Ga., Oct. 26.

Manganese in Ordnance Steel

To the Editor: Replying to the caution of J. J. Mahon in your issue of Aug 23, page 438, about going slowly in raising manganese, the caution is of course to be observed. Eat meat or cheese, not both. Manganese is to replace carbon. If you raise your manganese, you must lower your carbon proportionately. If the object is to be quenched, the quenching must be less violent than if it were of low-manganese steel. One cannot be sure beforehand whether the great advantages of replacing carbon with manganese apply to ordnance steel. They certainly would not unless the precautions of lowering the carbon content and lessening the violence of the quenching are observed.

Yours very truly,
H. M. HOWE.

Bedford Hills, N. Y., Oct. 26.

Will Need Equipment

The Defiance Machine Works, Defiance, Ohio, is expected to come in the market shortly for considerable additional machinery equipment. This company recently secured a large Government order for 3-in. anti-aircraft guns and several weeks ago purchased about $200,000 worth of heavy machinery, but will need additional machine tools.

The A. Cooper Metal Co., Inc., dealers in metals, 1226 Orange Street, Syracuse, N. Y., has bought the plant and equipment of the Barnes Gear Co., Oswego, N. Y.

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Abrogation of Contracts

The canvass of iron and steel manufacturers undertaken Oct. 20 by the Federal Trade Commission on the subject of abrogation of contracts has already brought forth some strong expressions of opinion, and no doubt can be entertained that the producers will make it clear that the proposition is altogether objectionable.

In one of its phases the proposition is distinctly of a character best described by the common expression "heads I win, tails you lose." There are contracts both at higher and at lower prices than those fixed. If the producer were to agree to the abrogation of contracts he would have relatively plain sailing with those of his customers who held contracts at higher than the set prices, but the case would be quite otherwise with those who held contracts at lower prices. The seller could hardly be asked to defend himself against the lawsuits which might be brought and the Government would be placed in a curious light if it appeared as defendant in such suits, when the plaintiff would naturally base his case largely on constitutional grounds.

Even in the case of contracts at higher than the set prices the purchaser in many cases would doubtless have objections to abrogation. The spread between the set price and the contract price might be regarded as an advantage rather than an encumbrance, as holding out promise of an earlier delivery, or valuable service in some other manner. The producers have not agreed to sell to the public at the set prices, for they cannot agree to sell more material than they have. The essence of the agreement, as regards sales to the public, is that if sales are made they are to be at not higher than the set prices. The buyer deprived of his contract would have no assurance that he could duplicate it at the set price.

There are two general classes of steel contracts, one covering specific construction jobs, the other covering prospective requirements, whether of distributers or of manufacturing consumers. In the case of the former, the buyer of the steel is one who has contracted to deliver to his customer possession of a certain thing—a bridge, a building, a given number of cars or locomotives or something of that general description. There certainly would be no justice to anyone in abrogating such a steel contract and not abrogating the contract for the delivery of the finished product, while on the other hand the ultimate buyer is naturally not one who would have a claim.

Doubtless some cases could be found in which enforcement of a steel contract would work hardship on the buyer, who may be selling in a competitive market in which some of his competitors would have an advantage through being able to buy at the set prices. Endless confusion would be created by any attempt to divide contracts into two classes, the one to be abrogated, the other not. It is generally felt that it would be difficult to find constitutional grounds for the abrogation of contracts, but to find grounds for the abrogation of some contracts and not of others would indefinitely increase the difficulty.

Contract revision is not an unknown thing in the steel industry. In every market decline there has been more or less give and take. Steel manufacturers have not undertaken to enforce contracts that would put customers out of business, and Washington has no occasion to assume that steel manufacturers would be less disposed to treat their customers fairly at this time than at other times. If Government price fixing has placed any buyer of steel in an impossible position the seller should be given an opportunity to take action on the particular case.

There is, however, probably no occasion for much alarm. The Federal Trade Commission appears simply in the light of seeking information. It asks questions that astonish the trade, but it is a case of asking questions, not of outlining a course of conduct. Grammatically the sentences are interrogative, not declarative. It is their suggestiveness that has disturbed the trade, but when the trade finds the suggestions impractical it should be assumed that the Federal Trade Commission will have occasion to reach the same conclusion.

There is no hint that the questionnaire looks to action by the Administration, through the War Industries Board or otherwise. No such idea can be entertained. It is purely a detail in the formulation of an iron and steel price control bill which may or may not be submitted to Congress in December, and which if submitted would certainly

be subject to thorough discussion. There is no harm done in thus early giving the matter airing. If this airing results in the contract abrogation idea being definitely abandoned before the proposed measure reaches Congress, it will be much better than having the matter broached as a new idea on the floor of either house.

Price Revision Jan. 1

Buyers and sellers alike in the iron and steel industry have been attaching great importance to the qualification in the Government's announcements of set prices for iron and steel that the prices are subject to revision Jan. 1 or later. It appears to be rather a common view that a revision Jan. 1 or soon afterward was distinctly contemplated.

There is good ground for argument, however, that the clause inserted was merely a saving one, to cover contingencies. To say nothing as to the probable duration of the set prices would be to create uncertainty, for they could not be expected to last forever. The Government desired that an agreement be announced as soon as possible, hence it was undesirable to consume additional time in endeavoring to arrive at a precise understanding with respect to the time element. From this viewpoint the setting of a date would merely indicate a limit, that the prices announced would at any rate not be changed before Jan. 1.

With the assumption that a revision of prices may occur Jan. 1 or soon thereafter, the question is raised whether the revision is likely to be upward or downward. The majority opinion is that any revision would be downward rather than upward. The one argument for an upward revision is based on the fact that the set prices are in the main an approximation to the average billing prices of the large steel interests at the time the announcement of set prices was made. These invoice prices have been continuously increasing for about two years and a half, trailing the open market, as lower priced contracts were worked off at intervals. From this viewpoint the service rendered by the set prices would be that of protecting the consumer not well provided with contracts against the competition of those who had been forehanded in buying. With contracts allowed to remain in force, the average billing price would be higher on Jan. 1 than on Oct. 1.

Arguments are more common, however, that if there is a revision in the iron and steel prices the revision will be downward. One argument is based on the circumstances attending the reaching of an agreement. It was a case of strategy, more or less. The manufacturers on the whole were disinclined to accept the "one price for all" principle. They were quite willing to make large concessions on steel required for prosecuting the war, but were indisposed to make equal concessions on material sold to the general public. The great objective of the Government, therefore, was to secure adoption of the "one price for all" principle and get the set price system established. Once established there might be opportunity for the securing of further concessions. Another argument used is that the iron and steel manufacturers may find the set price principle a better one, in actual practice, than they had expected, through the removal of uncertainties balancing the price concessions they have made. It is pointed out also that the iron and steel market had started to decline, in a modest way, before price fixing was definitely undertaken, and if the market taken over by the Government was a declining market there might possibly arise conditions that would suggest further declines, eventually, following the large reduction effected in the initial price setting.

It has been the common view that the prices that have been set—for pig iron, unfinished steel and certain finished rolled products—are in line with each other and constitute a well-proportioned structure. If so, any radical revision in one product would naturally suggest revision in others. Now it is well known that the authorities at Washington considered the $33 pig-iron price as rather a high one. It is stated that there has been strong feeling in certain circles in Washington that the pig-iron price should be as low as $27, and the prediction has even been ventured that if pig-iron prices are revised it will be to a $30 basis. Naturally the Government would be quite indisposed to reopen the subject for the sake of a minor revision of $1 or even $2 a ton, and if pig iron were readjusted to $30 it is improbable that the remainder of the list would entirely escape revision.

Considering all the views entertained, the preponderating opinion seems to be, first, that a downward revision is more probable than an upward revision, and, second, that the balance of probability is that there will be no revision Jan. 1 or soon thereafter.

War and Peace Business

Trade is in the midst of a conflict of two ideals —business as usual and marshalling all our industrial forces for prosecuting the war. Both are necessary, but they conflict or overlap, and no one can draw the line. All peace activities that do not interfere with striving to win the war are desirable, but the application of the definition is difficult.

In the early weeks after our declaration of war there was much false preaching from the text "business as usual." Some held that "business," no matter of what kind, should be stimulated. What is business at one end, however, may be pleasure at the other. Running a theater is business but attending the performance is not. Yet giving up amusements does not necessarily help win the war. Mind and body require relaxation and play at intervals that they may work the better when they are engaged at work.

It has become obvious that for the iron and steel industry no line can be drawn between the material that is needed for the war and the material that is not so needed. Washington takes the position that war orders must be considered first, but can present no budget. It is not a question of a precise tonnage being required of this or that material, for the material must be worked into its final form and the rapidity with which it can be handled is not known.

The Government does not require the tonnage of plates necessary to build a certain number of vessels. It desires all the plates that can be used in shipbuilding.

What adds complication to the issue between war and commercial steel is that the war steel is divided into two distinct categories—that which is needed for getting started and that which will be needed continuously, and presumably in larger and larger quantities. The equipment of the army cantonments falls in the one category, the supply of shells in the other. Steel for war craft lies largely in the first category, steel for merchant shipping lies in the second, with constantly increasing requirements as merchant shipbuilding capacity increases and is made more efficient. Some descriptions of war steel orders are practically completed, other descriptions are just appearing. In this respect the war work is passing out of its initial stage and tending to strike its more permanent gait.

A new complication is about to arise. The priority classification adopted a few weeks ago by the War Industries Board provides three great divisions —steel required directly for the war, steel indirectly involved, and all other. Relatively little has developed thus far that would fall in the second category, but undoubtedly much will develop. The railroads are very great consumers of steel and their efficient operation is necessary for prosecuting the war as vigorously as possible. One of the great questions Washington now has before it is what shall be done with, or for, the railroads. The matter cannot be approached without "eventual Government ownership" arising in its full height as a specter not to point the way but to show how serious is each step that may be contemplated.

To marshall all our industrial forces for the prosecution of the war means, in itself, that there should be no steel left for the third category in the priority sequence. Washington may not find it possible to map out such a course, but the attitude of the authorities in their dealings with the steel makers is that such a condition should be provided for. When the steel makers adopt the suggestion they produce complaint on the part of some buyers of steel. The mills have a large mass of business on books, and for smoother conduct of trade it would be better if they had less. The trend should be in the direction of reducing the tonnage on books, at a time when large additional orders are being placed by Washington.

As the volume of business on steel-mill books is reduced the situation will be made clearer for the producers, but not necessarily so for the consumers, who naturally cling to the belief that it is better to have an order on file, with no delivery, than to have nothing due them at all. If they have an order they can secure some semblance of a promise as to delivery, or at least an intimation, but when they have no order they can seek no more than a statement as to when material may be available and a statement under such circumstances naturally carries very little weight.

An unfortunate feature of the situation is that the reduction in the volume of business on steel-mill books now in progress may easily be misinterpreted by buyers. In the past such a decrease has been an unerring sign that steel is to become more plentiful, also cheaper. At this time the reduction is caused, in part at least, by an entirely new influence, that of the Government holding before the mills the prospect of an uncertain amount of business—uncertain as to its total tonnage and uncertain as to the classes of material that will make up the total. The commercial buyer of steel is not helped in his effort to judge whether or not steel will be available for him by the Government's request that those who receive orders from it refrain from giving information as to their character or extent. The commercial consumer may wish to conduct his business as usual, but he must take his own chances. It is one of the hardships of war, but, if possible, means should be found for lightening the hardship.

Organized Labor's Misguided Acts

Week before last the leaders of certain labor unions of the building trades called a strike of workmen engaged in the erection of an $8,000,000 addition to the Watertown Arsenal. The strike did not seriously interrupt construction because most of the men returned to work the next day, against the protests of their chosen leaders. This voluntary action encourages the belief that American workmen are at heart loyal and patriotic.

The thing that is of real moment is that strikes, threatening a delay to the rapid completion of war preparations, are possible. Local union leaders who call a strike to establish conditions contrary to the agreement, implied if not real, made between the Government and the head of the American Federation of Labor, lay themselves open to a charge of unpatriotic, if not treasonable, conduct. Col. Tracy C. Dickson, commandant of the Watertown Arsenal, states the opinion of the public, as well as of the War Department, when he says that an attempt to institute a closed shop policy and double time for overtime by means of a strike, without submitting differences to arbitration so that war work shall not be delayed, is unpatriotic.

The Watertown condition is wide-spread. Strikes and threats of strikes have hampered work in shipyards, steel mills, munitions plants and other vital industries, not to mention transportation and mining. One such threat, with which the Watertown strike is believed to be connected, is that made by the Boston Central Labor Union against the Aberthaw Construction Co., which has the contract to build the Government $9,000,000 destroyer plant that is to be operated by the Fore River Works of the Bethlehem Shipbuilding Corporation. President McGrady of that union is quoted by the Boston press as having stated that the destroyer plant "will not be completed by Jan. 1, as guaranteed to the Government, unless the job is made fair to union labor." Reputable papers claim that a movement is on foot to force the Aberthaw company to operate a closed shop or "every treasury of every labor union in the State will be exhausted, if necessary, to help the trade unions win this fight," as was alleged to have been said in the union meeting.

It will be difficult for labor leaders to get the

public to accept their statement that strikes for closed shops and extravagant overtime pay are necessary to prevent "the breaking down of our wage and working system," as was claimed to have been said by the agent of the structural steel workers on the Watertown job. The non-union public will not complacently look on while workmen, whose wages are higher than private industry not employed on war work can pay, engage in a campaign to block or delay the war program of the nation.

Labor leaders and editors of the labor press have an unwarranted belief that the great mass of working people indorse the full labor union program. Col. Francis J. Kernan was president of a board of army officers which investigated and reported, Jan. 4, 1917, upon the Government manufacture of arms, munitions and equipment. This report shows that in the whole country there were 18,654 plants capable of turning out war supplies, and of these only 1867 or 10 per cent were unionized. The figures for New England showed 2800 plants of which 259 were unionized. In other words, 90 per cent of the plants that are available for production of war supplies do not recognize the labor unions. Organized labor represents only a portion, and that a small portion, of the working people of the country. Its attempts to dictate to the Government will sooner or later bring upon it undesired legislative action.

The private interests of organized labor must give way before public necessity. The question is even more than a national one; it is international. It is unfair to bring an indictment of unpatriotic and selfish conduct against the rank and file of the unions. They are enlisting with patriotic ardor in the fighting forces and giving their money freely to aid the nation to win the war. The indictment rests upon their unwise and short-sighted leaders. It is these leaders who must provide prompt relief from the present harassing labor conditions. They must formulate a policy of loyal co-operation with the Government's program. Otherwise they may expect to see Government regulation of labor employed in the public service. Public opinion would not now countenance labor conscription; a few more strikes and threats of strikes may swing the sentiment of the public in favor of enlistment of labor.

When James A. Campbell, president Youngstown Sheet & Tube Co., said at the Cincinnati meeting of the American Iron and Steel Institute, "There is not much worth while in the world today except to win the war," he struck a responsive chord in the hearts of his hearers, as did also President Farrell of the Steel Corporation when he declared that "if the United States and its Allies should be defeated in the war, we should not be thinking of prices." There was, of course, keen interest in the future course of officials at Washington in regard to prices, but patriotic thoughts dominated everything. The meeting was noteworthy for the large attendance not merely at the opening session but at all the meetings. It was clear that the members profoundly appreciate their responsibilities and intend to perform their duty to the utmost of their ability.

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New Classification of Extras on Steel

Differentials Announced by Sub-Committee on Steel Distribution of American Iron and Steel Institute

WASHINGTON, Oct. 30.—The sub-committee on steel distribution of the American Iron and Steel Institute has prepared a list of differentials and extras on the basic prices which have heretofore been announced by the President. These differentials supplement those reported in THE IRON AGE of last week. In explanation of the extra lists James. B. Bonner, vice-chairman of the sub-committee, explains that they are "a compilation of the extras and differentials applicable to the various products shown, the base prices on which were recently fixed by the War Industries Board after approval by the President." Many of the extras shown have been in commercial use for a long period and the additions represent extras that have been applicable but have not been included in some of the extra cards. The present compilation is intended to assemble all of the extras and differentials in compact form for quick reference. Following is the list as promulgated:

STANDARD CLASSIFICATION OF EXTRAS ON STEEL BARS (EXCEPT SHELL STEEL) AND SHAPES UNDER 3 IN.

Extras in cents per pound to be added to the base price per pound.

Rounds and Squares

¾ to 3 1/16 in.	Base
⅝ to 11/16 in.	.05c. extra
½ to 9/16 in.	.10c. extra
7/16 in.	.20c. extra
⅜ in.	.25c. extra
11/32 in.	.30c. extra
5/16 in.	.35c. extra
9/32 in.	.40c. extra
¼ in.	.50c. extra
15/64 in.	.75c. extra
7/32 in.	1.00c. extra
3/16	1.25c. extra
3⅛ to 3 9/16 in.	.075c. extra
3⅝ to 4 1/16 in.	.125c. extra
4⅛ to 4 9/16 in.	.15c. extra
4⅝ to 5 1/16 in.	.20c. extra
5⅛ to 5 9/16 in.	.25c. extra
5⅝ to 6 1/16 in.	.375c. extra
6⅛ to 6 9/16 in.	.50c. extra
6⅝ to 7¼ in.	.025c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Flats

1 to 6 in x ⅜ to 1 in.	Base
1 to 6 in. x ¼ to 5/16 in.	.10c. extra
11/16 to 15/16 in. x ⅜ to ⅝ in.	.20c. extra
11/16 to 15/16 in. x ¼ to 5/16 in.	.25c. extra
9/16 to ⅝ in. x ⅜ to ½ in.	.25c. extra
9/16 to ⅝ in. x ¼ to 5/16 in.	.35c. extra
½ in. x ⅜ to 7/16 in.	.50c. extra
½ in. x ¼ to 5/16 in.	.60c. extra
7/16 in. x ⅜ in.	.70c. extra
7/16 in. x ¼ to 5/16 in.	.80c. extra
⅜ in. x ¼ to 5/16 in.	1.00c. extra
1⅛ to 6 in. x 1 1/16 to 1 3/16 in.	.05c. extra
1⅛ to 6 in. x 1¼ to 1½ in.	.10c. extra
1 ¾ to 6 in. x 1⅝ to 2¾ in.	.15c. extra
3⅛ to 6 in. x 3 to 4 in.	.20c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Angles

1½ x 1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.10c. extra
1½ x 1½ in. and wider, but under 3 in. wide x ⅛ in.	.15c. extra
1 x 1 to 1¼ x 1¼ in. x 3/16 in. and heavier	.15c. extra
1 x 1 to 1¼ x 1¼ in. x ⅛ in.	.20c. extra
⅞ x ⅞ in. x 3/16 in.	.20c. extra
⅞ x ⅞ in x ⅛ in.	.25c. extra
¾ x ¾ in. x 3/16 in.	.25c. extra
¾ x ¾ in. x ¼ in.	.30c. extra
⅝ x ⅝ in. x ¼ in.	1.10c. extra
⅝ x ⅝ in. x 3/32 in.	1.30c. extra
½ x ½ in. x ⅛ in.	1.60c. extra
½ x ½ in. x less than ⅛ in.	1.80c. extra
3 in. on one or both legs by less than ¼ in. thick.	.35c. extra

Unequal leg angles are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

Channels

1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.15c. extra
1½ in. and wider, but under 3 in. wide x ⅛ in.	.25c. extra
1 to 1¼ in. x 3/16 in. and heavier	.25c. extra
1 to 1¼ in. x ⅛ in.	.35c. extra
1 to 1¼ in. x 7/64 in.	.50c. extra
¾ and ⅞ in. x 3/16 in. and heavier	.30c. extra
¾ and ⅞ in. x ⅛ in.	.40c. extra
¾ and ⅞ in. x 7/64 in.	.55c. extra
⅝ x ⅛ in. and heavier	1.20c. extra
⅝ x 3/32 in.	1.40c. extra
½ x 7/64 in. and heavier	1.80c. extra
½ x 5/64. in.	2.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Tees

1½ x 1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.20c. extra
1 x 1 to 1¼ x 1¼ x 3/16 in. and heavier	.40c. extra
1 x 1 to 1¼ x 1¼ x ⅛ in.	.50c. extra
⅞ x ⅞ x 3/16 in.	.50c. extra
⅞ x ⅞ x ⅛ in.	.60c. extra
¾ x ¾ x 3/16 in.	.60c. extra
¾ x ¾ x ⅛ in.	.70c. extra
⅝ x ⅝ x ⅛ in.	1.30c. extra
½ x ½ x ⅛ in.	1.80c. extra

Unequal leg tees are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

Hexagons

¾ to 3 in.	.15c. extra
⅝ to 11/16 in.	.25c. extra
½ to 9/16 in.	.35c. extra
7/16 in.	.55c. extra
⅜ in.	.65c. extra
5/16 in.	.75c. extra
¼ in.	1.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Rounds

1 to 3 in.	.20c. extra
¾ to 15/16 in.	.35c. extra
⅝ to 11/16 in.	.50c. extra
½ to 9/16 in.	.70c. extra
⅜ to 7/16 in.	1.10c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Ovals

Gages shown are Birmingham Wire Gage

1 to 4 in. x ¼ in. and thicker	.25c. extra
1 to 4 in. x Nos. 7, 8, 9 and 3/16 in.	.35c. extra
1 to 4 in. x Nos. 10, 11, 12 and ⅛ in.	.50c. extra
¾ to 15/16 in. x 3/16 in. and thicker	.50c. extra
¾ to 15/16 in. x Nos. 10, 11, 12 and ⅛ in.	.65c. extra
¾ to 15/16 in. x Nos. 13, 14 and 15	.80c. extra
⅝ to 11/16 in. x 5/32 in. and thicker	.60c. extra
⅝ to 11/16 in. x Nos. 10, 11, 12 and ⅛ in.	.75c. extra
⅝ to 11/16 in. x Nos. 13, 14 and 15	.90c. extra
½ to 9/16 in. x ⅛ in. and thicker	.80c. extra
½ to 9/16 in. x Nos. 13, 14 and 15	1.05c. extra
⅜ to 7/16 in. x 3/32 in. and thicker	1.35c. extra
⅜ to 7/16 in. x Nos. 14 and 15	1.60c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Ovals

¾ to 2½ in. x ⅜ in. and thicker	.20c. extra
¾ to 2½ in. x ¼ in. to 5/16 in.	.30c. extra
¾ to 2½ in. x 5/32 in. to 3/16 in.	.45c. extra
⅝ to 11/16 in. x 5/16 in. and thicker	.35c. extra
⅝ to 11/16 in. x 3/16 in. to ¼ in.	.50c. extra
⅝ to 11/16 in. x ⅛ in. to 5/32 in.	.65c. extra
½ to 9/16 in. x ⅛ in. and thicker	.55c. extra
½ to 9/16 in. x ⅛ in. to 3/16 in.	.70c. extra
½ to 9/16 in. x 3/32 in.	.95c. extra
⅜ to 7/16 in. x 3/16 in. and thicker	1.20c. extra
⅜ to 7/16 in. x ⅛ in. to 5/32 in.	1.45c. extra
⅜ to 7/16 in. x 3/32 in.	1.45c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Bands

Gauges shown are Birmingham Wire Gauge

1½ to 6 in. x No. 7, 8, 9 and 3/16 in.	.20c. extra
1½ to 6 in. x Nos. 10, 11, 12 and ⅛ in.	.30c. extra
1 to 1 7/16 in. x Nos. 7, 8, 9 and 3/16 in.	.25c. extra
1 to 1 7/16 in. x Nos. 10, 11, 12 and ⅛ in.	.35c. extra
13/16 to 15/16 in. x Nos. 7, 8, 9 and 3/16 in.	.35c. extra
13/16 to 15/16 in. x Nos. 10, 11, 12 and ⅛ in.	.40c. extra
11/16 to ¾ in. x Nos. 7, 8, 9 and 3/16 in.	.50c. extra
11/16 to ¾ in. x Nos. 10, 11, 12 and ⅛ in.	.60c. extra
9/16 to ⅝ in. x Nos. 7, 8, 9 and 3/16 in.	.60c. extra
9/16 to ⅝ in. x Nos. 10, 11, 12 and ⅛ in.	.65c. extra

½ in. x Nos. 7, 8, 9 and 3/16 in..... .65c. extra
½ in. x Nos. 10, 11, 12 and ⅛ in..... .75c. extra
7/16 in. x Nos. 7, 8, 9 and 3/16 in..... .90c. extra
7/16 in. x Nos. 10, 11, 12 and ⅛ in.....1.05c. extra
⅝ in. x Nos. 7, 8, 9 and 3/16 in..... .95c. extra
⅝ in. x Nos. 10, 11, 12 and ⅛ in.....1.20c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Quantity Differentials

All specifications for less than 2000 lb. of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of exact quantity actually shipped.

Quantities less than 2000 lb. but not less than 1000 lb. ..... .15c. extra
Quantities less than 1000 lb..... .35c. extra

Straightening

Machine straightening ..... .10c. extra

Machine Cutting Rounds and Squares 1½ In. and Larger to Specified Lengths

Machine cutting to lengths over 48 in..... .15c. extra
Machine cutting to lengths over 24 in to 48 in., inclusive ..... .25c. extra
Machine cutting to lengths over 12 in. to 24 in., inclusive, ... .35c. extra
Machine cutting to lengths of 12 in. and less, extra will be furnished on application, but will not be less than ..... .45c.

The above extras apply only to 0.50 carbon and under. Extras for machine cutting over 0.50 carbon will be furnished on application.

Extras for machine cutting rounds and squares under 1½ in., flats, etc., will be furnished on application.

Cutting to Specified Lengths

Other than machine cutting

Cutting to lengths of 60 in. and over.....No charge
Cutting to lengths over 48 in. to 59 in., inclusive.. .05c. extra
Cutting to lengths over 24 in. to 48 in., inclusive.. .10c. extra
Cutting to lengths over 12 in. to 24 in., inclusive.. .20c. extra
Cutting to lengths of 12 in. and less extra will be furnished on application, but will not be less than ..... .30c. extra

STANDARD CLASSIFICATION OF EXTRAS ON STEEL PLATES

Extras in cents per pound to be added to the base price per pound.

Conditions

Rectangular plates, tank steel, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are Base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3/16 in. take the price of 3/16 in. plates, and all extras for width of 3/16 in. plates, as well as gage.

Allowable overweight, whether plates are ordered to gage or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Width

(Applies to plates ¼ in. thick and heavier)

Widths over 100 in. to and including 110 in..... .05c. extra
Widths over 110 in. to and including 115 in..... .10c. extra
Widths over 115 in. to and including 120 in..... .15c. extra
Widths over 120 in. to and including 125 in..... .25c. extra
Widths over 125 in. to and including 130 in..... .50c. extra
Widths over 130 in. to and including 135 in.....1.00c. extra
Widths over 135 in. to and including 140 in.....1.25c. extra
Widths over 140 in.....1.50c. extra

Gages

Gages lighter than ¼ in. to and including 3/16 in. in thin edges up to 72 in. wide, inclusive..... .10c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 72 in. wide to 84 in. wide, inclusive ..... .20c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 84 in. wide to 96 in. wide inclusive ..... .30c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 96 in. wide to 100 in. wide inclusive ..... .40c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 100 in. wide to 103 in. wide inclusive ..... .45c. extra

Grades

Pressing steel ..... .10c. extra
Flange steel (boiler grade) ..... .15c. extra
Ordinary firebox steel ..... .20c. extra
Stillbottom steel ..... .30c. extra
Locomotive firebox steel ..... .50c. extra
"Marine" steel .....1.50c. extra
Material subject to Navy Department inspection.. .10c. extra
High tensile hull steel to U. S. Navy Dept. or equivalent specifications ..... 1.00c. extra
Navy Department boiler steel, Classes A and B..1.50c. extra

Hull plates to hull specifications required to stand cold flanging take extra for flange steel.

Cutting

Rectangular Plates.

Lengths 3 ft. and over ..... No extra
Lengths under 3 ft. to 2 ft. inclusive..... .25c. extra
Lengths under 2 ft. to 1 ft. inclusive..... .50c. extra
Lengths under 1 ft.....1.55c. extra

Regular Sketches

(With not more than four straight cuts—including straight taper plates)

Length 3 ft. and over ..... .10c. extra

Irregular Sketches

(With more than four straight cuts)

Lengths 3 ft. and over ..... .20c. extra

Sketches sheared to a radius take circle extras.

Circles

Diameters 3 ft. and over .....25 per cent of base price

Half circles take circle extras.

Special.

Wasteful or difficult sketches, including hexagons, octagons, etc., are subject to special extras.

Sketches or circles over 100 in. in width or diameter take width extras in addition to sketch or circle extras.

Sketches cannot be sheared with re-entrant angles.

All sketches, regular, irregular, circular, semicircular or special, with greatest dimension under 3 ft., take length extras shown under rectangular plates, in addition to sketch or circle extra.

For cold sawing such items that cannot be sheared (such as stem bars), extra of 0.25c. will apply.

Floor Plates

Ribbed, diamond, checkered .....1.75c. extra
(Floor plates are not furnished to sketch).

Inspection

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

STANDARD CLASSIFICATION OF EXTRAS ON STANDARD STRUCTURAL SHAPES

Extras in cents per pound to be added to base price per pound.

Standard structural beams and channels 3 to 15 in., inc..... Base
Angles, structural sizes, 3 to 6 in. on one or both legs, ¼ in. thick and over..... Base
Zees, structural sizes ..... Base
Standard structural beams, over 15 in..... .10c. extra
Angles, structural sizes, over 6 in. on one or both legs ..... .10c. extra
Tees, structural sizes, excepting elevator, hand rail, car truck and conductor rail tees ..... .05c. extra
Bulb beams ..... .30c. extra
Bulb angles (not including special bulb angles for torpedo boat destroyers) ..... .30c. extra
Cutting to lengths under 3 ft. to 2 ft. inclusive.... .25c. extra
Cutting to length under 2 ft to 1 ft. inclusive..... .50c. extra
Cutting to length under 1 ft.....1.55c. extra

No charge for cutting to length 3 ft. and over; all material is subject to the following tolerances.

	Over.	Under.
Beams and channels	⅜ in.	⅜ in.
Angles, tees, zees and other shapes—structural sizes	¾ in.	0 in.

Cold sawing to exact length..... .25c. extra
Material subject to Navy Department inspection.. .10c. extra
Navy Department high tensile steel .....1.00c. extra

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

Extras on special sections subject to determination.

EXTRAS ON OTHER FORMS OF STEEL

Concrete Reinforcing Bars

Twisted squares ..... .125c. extra
Deformed sections ..... .075c. extra

Rivet Rods

Medium steel ..... Base
High tensile (subject to Navy specifications).....4.05c. extra

Spring Steel

Railway spring steel ..... .25c. extra
Automobile spring steel ..... .25c. extra
Open hearth vehicle spring steel..... .25c. extra
(Full extras spring steel card Aug. 20, 1914, for size and cutting, etc.)

Hoop

No. 13 gage and lighter ..... .60c. extra
(Full extras per hoop card of Jan. 2, 1913, for size, cutting, etc.)

Tire

Iron finish, 1½ x ½ in. and larger..... Base
Iron finish under 1½ in. x ½ in..... .15c. extra
Planished and machine straightened ..... .20c. extra
(Extras per tire card of Sept. 1, 1909, for size and quantity.)

Specifications and Inspection

Material subject to Navy Department inspection.. .10c. extra
Navy Dept. high tensile steel (excepting rivet rods) .....1.00c. extra

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

Extras on special sections subject to determination.

Carbon Extras

If specified up to 0.20 per cent..... No extra
If specified 0.21 per cent to 0.50 per cent..... .05c. extra
If specified 0.51 per cent and over..... .15c. extra

Iron and Steel Markets

MAKERS FIXING PRICES

Washington Showing Confidence in Trade

Price Meetings Now in Progress—Further Recessions Toward Expected Levels

Events continue to show that the War Industries Board is taking a minor position in price fixing. A list of extras to apply to bars, shapes and plates has been announced through a subcommittee of the American Iron and Steel Institute, and the general committee of the Institute and its subcommittee chairmen are now in session in New York to settle finally the price question on products not yet fixed. It is doubtful if a conclusion will be reached at the one conference, but the situation now points to a clearing in a matter of days of the atmosphere of uncertainty.

The whole movement indicates that a broad spirit of confidence is reposed in the representatives of the steel makers. The trade may accordingly expect schedules of prices with spreads commensurate with those of the prices already established. Like the extras just promulgated, recognized trade practices will undoubtedly be followed, even to adopting, as in this case, the minor departures which the special demands coming originally from Europe brought into being.

Meanwhile prices have been dropping toward levels which are regarded as marking the new maxima. Blue and box annealed sheets are now obtainable at 3c. per lb. less than in late September and galvanized sheets and tin mill products at 2c. less. Last week cold-rolled strip steel fell from 9c. to 7c. per lb. On Government business, to be sure, but also indicating the tendency, about 4000 tons of rivets were sold at $5 to $7 below regular quotations.

The low rate at which business has been booked for some months and the relative smallness of the specific orders yet given out for ship and shell material have lightened order books. One steel maker expects shortly to be able to take on contracts for the first quarter of 1918 in the finished steel lines for which prices were fixed. What a difference the new conditions impose is shown in a statement that the company has already received complete specifications for fourth quarter business, which averages 4.25c. for bars against 2.90c., the fixed price, and 4.50c. for shapes and 8c. for plates, against 3c. and 3.25c., respectively.

While mills have been able to reach rolling of fourth-quarter commitments, even of plates in some cases, deliveries on new general business will, of course, be upset if the Government begins to call for large quantities. An outside estimate of the structural steel alone to be required for shipbuilding in 1918 is 2,000,000 tons, and the minimum 1,300,000 tons, which compares with slightly over 3,000,000 tons, the country's annual capacity in shapes.

Added to the structural-steel ship needs is 1,500,000 tons of steel shortly to be distributed for 51,000,000 shells, to be turned out naturally as fast as possible, and some of it, of course, on structural rolling mills.

No complaint is heard of the delivery of ship material. In fact, it has reached yards ahead of needs. The labor shortage is the all-important point, and shipbuilders are in session in Washington at this writing, chiefly to discover how they can get the 300,000 men which it is estimated must be had.

Buying of pig iron is not very active on account of the unwillingness of furnaces to take on additional tonnages. As the weeks pass, the scarcity of iron for delivery this year and in the first quarter of next is being emphasized. Southern furnaces are especially conservative. They believe that all the iron which Northern furnaces can possibly furnish will soon be sold, and that then there will be no difficulty in disposing of the Southern product, which in competitive markets would have to be moved at less than the maximum price set. During the past week there has been fair buying of basic, Bessemer and foundry grades in the Pittsburgh district at Government prices.

The coke situation continues to annoy furnace operators, and more of them are in danger of being compelled to bank on account of inadequate supplies. The fuel administrator has agreed to apportion the supply of coke according to the amount of business in hand for the Government.

A conference in Washington on Wednesday, on tin plate, is expected to be followed shortly with an announcement on tin-plate prices. A meeting has been called for Thursday to smooth out the question of steel supplies to the automobile trade.

The United States Steel Corporation's statement for the third-quarter earnings gives a sidelight on the increased cost of doing business. Earnings before deductions on account of income and war taxes were close to $132,000,000, while for the second quarter they had been nearly $145,000,000. A part of this difference covers "allowances for estimated proportion of extraordinary cost of facilities installed by reason of war requirements." The income and war taxes amount to 11½ per cent more than the net income of $55,245,377 after making depreciation charges.

Chicago

CHICAGO, Oct. 29.

In no direction is the market active, except where Government needs are concerned. For the emergency fleet, notable orders for plates and shapes continue to be placed. With plates, shapes and bars, the situation is unchanged with respect to the requirements of ordinary industry, but it is pointed out that the mills are now working into their fourth quarter contracts and some relief for the new buyer may come with the end of the year. As for the mills, they are hampered by the fact that the so-called official prices on the products named obtain only until Jan. 1, and this fact, together with other uncertainties, makes it difficult for them to plan ahead. No more bars at 2.90c. are being offered,

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	Oct. 31, 1917.	Oct. 24, 1917.	Oct. 3, 1917.	Nov. 1, 1916.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia	$34.25	$34.25	$34.25	$22.50
No. 2, Valley furnace	33.00	33.00	33.00	23.00
No. 2, Southern, Cin'ti	35.90	35.90	....	19.90
No. 2, Birmingham, Ala.	33.00	33.00	....	17.00
No. 2 furnace, Chicago**	33.00	33.00	....	24.00
Basic, del'd, eastern Pa.	33.75	33.75	....	21.50
Basic, Valley furnace	33.00	33.00	33.00	22.00
Bessemer, Pittsburgh	37.25	37.25	37.25	26.95
Malleable Bess., Ch'go**	33.00	33.00	....	24.00
Gray forge, Pittsburgh	32.75	32.75	....	22.95
L. S. charcoal, Chicago	37.50	37.50	....	20.25
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$33.00
O.-h. rails, heavy, at mill	....	....	....	35.00
Bess. billets, Pittsburgh	*$47.50	*$47.50	....	50.00
O.-h. billets, Pittsburgh	*47.50	*47.50	....	50.00
O.-h. sheet bars, P'gh	*51.00	*51.00	....	50.00
Forging billets, base, P'gh	....	....	....	75.00
O.-h. billets, Phila.	....	....	....	50.00
Wire rods, Pittsburgh	57.00	57.00	....	60.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia	4.25	4.25	...	2.659
Iron bars, Pittsburgh	...	...	...	2.85
Iron bars, Chicago	4.50	4.50	...	2.40
Steel bars, Pittsburgh	2.90	2.90	...	2.75
Steel bars, New York	3.095	3.095	...	2.919
Tank plates, Pittsburgh	†*3.25	†*3.25	...	4.00
Tank plates, New York	...	...	...	4.169
Beams, etc., Pittsburgh	3.00	3.00	...	2.75
Beams, etc., New York	3.195	3.195	...	2.869
Skelp, grooved steel, P'gh	*2.90	*2.90	...	2.70
Skelp, sheared steel, P'gh	*3.25	*3.25	...	2.80
Steel hoops, Pittsburgh	...	...	...	3.00

*Agreed prices. †As yet only a few sales made.

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	Oct. 31, 1917.	Oct. 24, 1917.	Oct. 3, 1917.	Nov. 1, 1916.
Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	...	...	...	3.40
Sheets, galv., No. 28, P'gh	...	...	...	4.90
Wire nails, Pittsburgh	...	...	...	2.70
Cut nails, Pittsburgh	...	...	...	2.70
Fence wire, base, P'gh	...	...	...	2.65
Barb wire, galv., P'gh	...	...	...	3.55
Old Materials, Per Gross Ton				
Iron rails, Chicago	$34.00	$36.00	$36.00	$22.00
Iron rails, Philadelphia	38.00	38.00	43.00	21.00
Carwheels, Chicago	26.00	26.00	24.00	16.00
Carwheels, Philadelphia	29.00	29.00	29.00	16.50
Heavy steel scrap, P'gh	27.00	27.00	33.00	19.00
Heavy steel scrap, Phila.	25.00	25.00	25.00	16.50
Heavy steel scrap, Ch'go	26.00	26.00	27.00	18.75
No. 1 cast, Pittsburgh	27.00	27.00	30.00	16.00
No. 1 cast, Philadelphia	28.00	28.00	28.00	16.75
No. 1 cast, Ch'go (net ton)	20.00	20.00	21.00	14.75
No. 1 RR. wrot, Phila.	35.00	35.00	43.00	23.00
No. 1 RR wrot, Ch'go (net)	28.50	28.50	30.00	19.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$7.50
Furnace coke, future	6.00	6.00	6.00	4.00
Foundry coke, prompt	†*6.00	†*6.00	...	7.00
Foundry coke, future	†*6.00	†*6.00	...	4.50
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	23.50	23.50	23.50	29.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	28.50
Spelter, St. Louis	7.75	8.00	8.12½	10.37½
Spelter, New York	8.00	8.25	8.37½	10.62½
Lead, St. Louis	5.62½	6.12½	7.82½	6.90
Lead, New York	5.75	6.25	7.95	7.00
Tin, New York	66.00	61.62½	60.50	41.87½
Antimony (Asiatic), N. Y.	14.25	14.75	15.00	13.00
Tin plate, 100-lb. box, P'gh	....	....	....	$5.75

presumably because the mills have not got them to offer. Rail carbon bars are quoted at 4c., Chicago, and higher, and are quiet, largely because of the uncertainty surrounding re-rolling rails. Consumers are hoping that the Government will readjust scrap prices, but many of the dealers are averse to this being done, believing that the prices will automatically arrive at their proper levels when prices for finished products are fixed. In the absence of definite price announcements, sheets are weak and uncertain. From Washington it is reported that prior to Sept. 1, 1918, the ordnance department of the army alone will require 1,500,000 tons of shell steel, and the question arises how far this will detract from production in other directions. Similar thoughts have arisen, of course, with regard to all of the Government's gigantic requirements. Though the volume of sales has not been large, and the market as a whole is quiet, the pig iron market is being more firmly established on the basis of $33, furnace, for foundry iron. Dealers report that the old material market is hardening, also that the mills are sounding the situation, but the fact remains that consumers have not yet started to buy.

Ferroalloys.—The market is quiet, and prices soft at $275 quoted for next year and $300 for this, although it is probable that the lower price would secure delivery this year, also. For 10 per cent Bessemer ferrosilicon, $57.50, furnace, is quoted, and for 11 per cent, $61.50, delivery next year. An inquiry for 500 tons of Bessemer ferrosilicon, 1918 delivery, is before the trade.

Plates.—No change of moment can be reported, the makers continuing to point out their sold-up condition so far as this year is concerned, while the Government demands are looming up greater than ever. It is reported that one lot was sold on the basis of 4.50c., Pittsburgh, domestic bill of lading, although it was understood that it was for export to a neutral country. Another lot is reported to have been sold for Japanese delivery on the basis of 3.25c., Pittsburgh, the official price. The most reassuring thing about the plate situation is that the mills are now working out of their fourth quarter contracts and plates may be more easily obtainable after Jan. 1, but, on the other hand, it is expected that some material, the export of which has been held up by Government order, may be released for foreign delivery. A new 160-in. sheared-plate mill at the Gary works of the Illinois Steel Co. has been completed and it will soon be in commission on Government orders.

For material out of warehouse the quotation is 7c.

Pig Iron.—Taken as a whole, business is light, but some sales have resulted from what inquiry has come out, all of it on the basis of so-called Government prices. Re-sale foundry iron in consumers' hands has almost disappeared, but enough has been available to permit of small sales from day to day. Small lots of Southern iron have been sold at $33, Birmingham, or $37, Chicago. The principal Northern producer has no iron to offer this side of next February, in which month a new furnace goes in. Orders have been booked against this new source at prices based on the official figures. A Milwaukee consumer has taken 1000 tons of standard Bessemer at $36.30, furnace, this price carrying the agreed differential of 10 per cent or $3.30 over No. 2 foundry or basic. Some off basic has sold as low as $28, delivered, in this market. A Chicago foundry is inquiring for 2000 tons of No. 2 for next year, and a plow manufacturer wants 500 tons of high silicon iron for this year. No sales in malleable Bessemer are reported. Most of the large consumers are covered for this year and the first half of next, the current inquiry coming mostly from the smaller melters who want prompt iron. A Southern producer is offering No. 3 at $32.50, furnace, and some No. 4 at $32.25, both these prices being predicated on the official base; shipments to be in the last three months of this year. Much difference of opinion—it is all guesswork—exists as to what action on pig iron the Government will take at the end of this year when the present price agree-

ment expires. It is predicted that if the base price is lowered, some of the smaller furnaces which are not self-contained will be forced out of business. At the same time, some buyers feel that a reduction is so probable that they hesitate about buying into next year at present prices. Some Lake Superior charcoal, but not a great deal, has been placed at the base price of $35.50, f.o.b. furnace. A Jackson County, Ohio, producer of silvery has authorized his agent here to dispose of silvery grades, delivery next year, on the basis of $43, furnace, for 7 per cent silicon, each unit of silicon over or under being figured at $3, this making 6 per cent $40, 8 per cent $46, etc. For 10 per cent, $52.50 is asked. Nothing is said of prompt deliveries. These prices take a freight rate of $2.54 to Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	*$37.50
Lake Superior charcoal, Nos. 5 and 6 and Scotch	*40.00
Northern coke foundry, No. 1	†33.50
Northern coke foundry, No. 2	*33.00
Northern coke foundry, No. 3	†32.50
Northern high-phosphorus foundry	†33.00
Southern coke No. 1 foundry and 1 soft	†37.50
Southern coke No. 2 foundry and 2 soft	*37.00
Malleable Bessemer	†33.00
Basic	*33.00
Low-phosphorus	†58.00
Silvery, 7 per cent	†45.54

*Agreed prices at which sales have been made.

†Agreed prices—sales not reported.

Note.—All sales limited in volume.

Structural Material.—After Jan. 1, next, some relief may come to consumers of shapes, but until that time there does not seem to be much hope, not only because of the overloaded condition of the mills, but because of the steady demands of the Government for both shapes and plates required for the creation of the emergency fleet. Therefore the Government price of 3c. may well be called theoretical. No structural lettings are announced. The Illinois Central Railroad has placed 500 hopper cars, and is in the market for 1000 70-ton gondolas.

For material out of warehouse the quotation is unchanged at 5c.

Bars.—Makers of rail carbon bars, who continue to quote 4c. to 4.50c., Chicago, are keenly interested in the proposed Government price-fixing of scrap, inasmuch as their raw material consists of rerolling rails. An Eastern mill, which recently sold some hard steel bars at 2.90c. has no more to offer at present, but expects to come in the market again on the same basis. Very little is being done and this situation will continue until some definite steps are taken to fix the price of rerollers. Bar iron is quiet at 4.50c., Chicago. None of the mills is offering mild steel bars, having none to sell for this year's delivery.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The much delayed "Government" prices have not yet appeared; meanwhile buyers and sellers are puzzled. The mills, however, appear to want business despite recent Government orders. One will take a limited tonnage at a price to be determined later. A good tonnage has been placed at 5c., Pittsburgh, for No. 28 black, this price being acceptable where a buyer refused to accept a tentative price subject to revision when some agreed price was reached by producers and the Government. It may be that some definite price information will follow a meeting of the sheet interests at Pittsburgh to-morrow. Blue annealed (No. 10) are quoted at 5.50c. to 6c., Pittsburgh; No. 28 black at 6c., and No. 28 galvanized at 7.50c. to 8c., Pittsburgh, each taking a freight rate of 21.5c. Jobbers have reduced their prices on sheets out of warehouse.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8c.; No. 28 black, 8.50c.; and No. 28 galvanized, 9.50c.

Bolts and Nuts.—No price changes are reported. Specifications against contracts are more active, and consumers, including two or three railroads, are inquiring for 1918 delivery. They would like to buy at a lower level than now prevails, but so far the makers see no justification for lowering their quotations. They find it a troublesome matter to get sufficient bars and rods wherewith to make their products. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 1091.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Langdon, N. D., is expected to let 250 tons to-day, and Kansas City, Kan., will let an equal quantity to-morrow, these 500 tons about summing up the situation. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Wire Products.—As was expected, the leading interest has advanced its quotations, now naming 3.50c. instead of 3.20c., Pittsburgh, for nails, as its base. The new quotations, on this basis, are as follows: Plain fence wire, 3.25c.; painted barb wire, 3.65c.; galvanized barb wire, 4.35c.; polished staples, 3.65c., and galvanized staples, 4.35c., all Pittsburgh. In the past few days, demand for barb wire for farm use has been especially active. Independent makers continue to quote on the basis of 4c., Pittsburgh, for nails. We quote their prices to jobbers, per 100 lb., as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago carload lots.

Old Material.—Dealers feel that the market is stronger, probably because they realize that certain needs of the mills are becoming acute. That the latter is true is indicated in part by the fact that consumers are casting around for information, but as yet there is no active trading. Activity appears to be held up pending determination as to what, if any, agreement will be reached between the dealers and the War Industries Board, altogether a puzzling proposition, some interests asserting that prices will be officially fixed, others that they will be left to adjust themselves. Whether or not a price agreement is reached, the mills must sooner or later enter the market. The proposal that heavy melting steel be officially put at $30 is not favorably regarded except by the scrap interests. A fair-sized list issued by the Rock Island was closed to-day, this being the only one reported. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$34.00 to $35.00
Relaying rails	50.00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35.00
Old steel rails, less than 3 ft	31.50 to 32.50
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.50 to 24.00
Steel axle turnings	19.00 to 20.00

Per Net Ton

Iron angles and splice bars	$33.00 to $34.00
Iron arch bars and transoms	34.00 to 35.00
Steel angle bars	23.00 to 24.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	30.50 to 31.50
No. 2 railroad wrought	28.00 to 29.00
Cut forge	26.00 to 27.00
Pipes and flues	17.50 to 18.50
No. 1 busheling	20.50 to 21.50
No. 2 busheling	14.50 to 15.50
Steel knuckles and couplers	29.00 to 30.00
Coil springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	29.00 to 30.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 15.50
Cast borings	14.25 to 15.25
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15.50 to 16.50
Grate bars	14.50 to 15.50
Brake shoes	15.00 to 16.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	15.50 to 16.50

Rails and Track Supplies.—Authorities in close touch with the railroads and their needs are deeply concerned over the extent to which the roads need supplies and equipment and the scanty supply there is wherewith to serve them. It is predicted that the Government may yet have to take a hand in securing for them material with which they may keep themselves in a position to handle the traffic imposed on them by the war. We quote more or less nominal prices as follows:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Philadelphia

PHILADELPHIA, Oct. 30.

An increasing number of transactions in finished steel at the Government prices is noted in this market. A leading producer of structural shapes has not only been accepting business, but has been soliciting it, promising deliveries of moderate tonnages in two to four months at the 3c. price. Another Eastern steel company, with sales office here, will begin accepting contracts in a week or ten days for delivery of plates, shapes and steel bars in the first quarter of 1918 at the fixed prices. This company has just received complete specifications for fourth quarter from its customers, and reports not a single cancellation, though its shipments will average about 4.25c. for bars, 4.50c. for shapes and 8c. for plates, Pittsburgh. There is no activity as yet in semi-finished material, on which new prices were recently announced. Apparently authentic reports are heard of business being done in finished material at premium prices, though it is not clear that any of the mills which agreed on prices with the Government have been a party to such selling. Steel men here declare the time has come for the Government to insist upon every one in the iron and steel trade doing his full duty in upholding the war program, and it is broadly hinted that companies which have adopted an unpatriotic policy will hear from Washington. It is no secret that a majority of the steel companies would prefer to follow the Government program willingly than to be placed under such control as would be exercised if the Pomerene bill were passed.

Pig Iron.—The pig iron market here is described as being as nearly normal as could be expected under the circumstances. There is no large volume of buying either for prompt or forward delivery, but a fair number of small tonnages for delivery over the remainder of the year have been booked during the past week, mostly in foundry grades, and there is a good inquiry for next year. The trade is awaiting anxiously the expected announcement from Washington on the differentials to be charged above and below the $33 base price, which may come at any time. The suggestions of the pig iron producers, as conveyed to the War Industries Board by the committee of the American Iron and Steel Institute, have caused discussion in Washington, and the sellers here give credence to reports that members of the War Industries Board have objected to some of the differentials as being too high. A reduction of $5 per ton in the prices of low phosphorus iron, which were fixed in the recommendations at $53 and $58 for copper bearing and copper free, respectively, is suggested as probable. The differentials tentatively established on foundry grades were criticised also, it is learned, and the War Industries Board may suggest a reduction from $1 to 50c. per half unit; that is to say, iron analyzing 2.75 to 3.25 per cent silicon would be fixed at $1 above the base price, or $34, instead of $34.50, as suggested by the producers. Orders which have been placed recently by the Navy Department have been on the basis of a 50c. differential for each half unit above 1.75 to 2.25 per cent silicon, the standard fixed for No. 2 foundry. It is said that producers of foundry grades which run low in silicon and low in sulphur maintain that they should not be compelled to accept a price below the $33 base price, their contention being based on the fact that sometimes a coke iron analyzing low in silicon and sulphur is acceptable by certain melters—car wheel makers, for example—as a substitute for some grades of charcoal iron which, under the tentative schedule were to bring higher prices, warm blast Lake Superior charcoal iron having been tentatively fixed at $35.50. It is said that a few contracts for pig iron have been placed in this market, with a clause providing that the price will be revised to meet any change which the Government may make on Jan. 1, next, but some sellers insist that with this clause omitted contracts made now for next year's delivery must stand regardless of any change in the Government price. Pressure is said to have been brought to bear in Washington by several makers of finished steel for a lower price on pig iron Jan. 1, or higher prices on steel, particularly plates. Sales of low phosphorus iron, while not numerous, have been made in a few instances at a tentative price, later to be revised to the price the Government fixes. We quote the following standard grades at furnace; to these prices the freight rate to destination should be added:

Eastern Penna. No. 2 X	*$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	*33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	*32.00
Bessemer	*36.30

*Subject to revision.

Ferroalloys.—Very little business in ferromanganese is being done in this market, hence it is difficult to quote a price. There are reports of small tonnages at $250 to $260. Spiegeleisen has been sold recently at $75, furnace, but there is no doubt $67.50 to $70, furnace, could be done. One lot of 1000 tons is offered here at $70.

Coke.—The coke situation shows no material improvement, though small lots of furnace coke for prompt delivery have been sold in the past week at $6, ovens. A coke maker who declined to ship coke at $6 to a customer who had a contract for a specified quantity each month at the current market price has been ordered by the Fuel Administration to fulfill his contract. A few small lots of foundry coke have been sold for 1918 delivery at a tentative price of $7 per ton at ovens, this price to be revised, if necessary, to conform to the Government price announcement.

Sheets.—Competition for business and the expectation of an announcement in Washington of fixed prices on sheets has been driving prices down. To-day several large consumers were quoted 6c. to 6.25c. base, Pittsburgh, on blue annealed and black sheets and 7c. to 7.50c. on galvanized. A few makers have accepted orders at going market prices, with the proviso that when the Government announcement is made any unfilled tonnage will be delivered at the new price. Deliveries on mill rollings are being promised in four to six weeks. A leading seller of sheets reports a brisk demand for small lots and offerings on its stock sheets bring quick response, indicating that many consumers are going along from hand to mouth until the price is fixed.

Finished Steel.—More business is being done at the Government prices, especially in shapes. A leading producer of shapes has been actively soliciting business in the past week, offering small tonnages, say 100 to 200 tons, for delivery in two to four months, from mill rollings. In most instances, these rollings are worked in with Government orders. It has been and will continue to be this company's policy not to contract more than a few months ahead, and its sales will undoubtedly relieve the building situation to a small extent. An Eastern steel company, with sales office here, will open its books in a week or 10 days for orders for first quarter delivery at the Government prices. This company has required its specifications for fourth quarter to be in its hands by Nov. 1 and reports that there was not a single cancellation, though much of its business was taken at 4.25c. for steel bars, 4.50c. for shapes and 8c., Pittsburgh, for plates. Other companies are now considering what they may be able to do next year for their regular contract customers. One com-

pany says it may be able to award such customers only 25 to 50 per cent of their regular specifications. It is apparent that there will be less of a tendency to contract ahead for next year, not only because of the sold-up condition of the mills and the uncertainty as to extent of Government demands, but because of the mills' experience in the past year, when customers, with low-priced contracts, specified so heavily on a rising market that it proved an embarrassment to the producers. Reports that are apparently authentic are heard that fair tonnages of plates have been sold at 7c. to 8c., Pittsburgh, for prompt delivery. These plates were sold to Japan, but on account of the embargo cannot be shipped. Warehouses are doing an abnormal business in all lines of finished steel, but it is declared that when their present contracts are run out, many of them may not find it possible to keep up their stocks. Large prospective orders from the Emergency Fleet Corporation are now being received, with more to follow, and a majority of the mills will be so fully occupied with these rollings that they will have barely enough left to take care of commercial business now on their books, and deliveries on some of the latter material may be postponed. Several selling offices here state they are not at all disposed to consider any new business for nearby or forward delivery at the present time. This applies particularly to plates, shapes and bars. Concrete bars and special alloy bars are to be had in some instances for fairly prompt delivery. The Belmont Iron Works received the contract for fabricating 1500 tons of structural material for the Watertown Arsenal.

Old Material.—Dealers in iron and steel scrap who attended the meeting of the American Board of Scrap Dealers in Pittsburgh last week returned to their offices resolved to do everything possible to co-operate with the American Railway Association in reducing losses in time and efficiency from frequent re-consignment of cars. It is estimated that 15,000 cars are in constant use for the transportation of iron and steel scrap, and by careful methods it is believed that this number can be reduced to 10,000. One who attended the Pittsburgh meeting says that only by the patriotic co-operation of the trade can drastic embargoes by the railroads be prevented. A bureau will be opened in the office of C. A. Barnes, Widener Building, secretary of the association, for the inspection of rejected material, and it will be the aim of this bureau to prevent more than one re-consignment of rejected cars. Business is almost at a standstill, some sales, however, being made to brokers who have orders to fill. The probability that if the Government fixes prices, they will not be lower than on the basis of $30 per ton for No. 1 heavy melting steel has, to a certain extent, stiffened the views of those having stocks on hand. Mills have offered $25 for melting steel, but apparently without success. A few sales have been made at about $28. The prices quoted below for delivery in the Philadelphia market are more or less nominal and represent the views of dealers rather than actual sales:

No. 1 heavy melting steel	$25.00 to $30.00
Steel rails, re-rolling	38.00 to 40.00
Low phosphorus heavy melting	35.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turning (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00 to 22.00
No. 1 cast	28.00 to 30.00
Grate bars	20.00 to 22.00
Stove plate	20.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

Billets, Slabs, Etc.—So far as can be learned no sales of billets, slabs, sheet bars or wire rods have been made in this market since the new Government prices were announced.

Bar Iron.—A few small mills in this district which were selling bar iron as low as 4.25c., Pittsburgh, for delivery over the remainder of this year and into next year have apparently taken all of the orders they can conveniently handle, and the larger producers continue to book business at prices ranging from 4.75c. to 5c., Pittsburgh, with occasionally a price as low as 4.50c. being heard. A fair volume of business is being done.

Cleveland

CLEVELAND, Oct. 30.

Iron Ore.—Heavy snow storms and low temperature interfered seriously with shipments from the head of the Lakes the past week. The loading of boats has been delayed by frozen ore and vessels have been kept in shelter for some time waiting for better weather. Other delays having occurred during the month because of storms, it is probable that October shipments will show some falling off as compared with September. Boats are behind on the shipping schedules worked out by the sub-committee of the Council of National Defense, but if weather conditions are normal during November it is expected that consumers will be supplied with enough ore to cover their requirements until the opening of the 1918 season of navigation. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for foundry iron for the first half of 1918 in lots up to 1000 tons continues fairly active and some orders for malleable iron are being booked for the same delivery. There is also some demand for both grades for November and December shipment, part coming from consumers unable to get shipments on regular contracts as fast as needed. Iron for this year's delivery is scarce and sellers could doubtless get premium prices for early shipment were they disposed to sell at higher than the Government prices. In fact, one consumer who has an inquiry out for 1000 tons of malleable iron for this year's delivery has virtually offered $10 per ton above the Government price for this iron. Sellers, however, will not sell any iron that they have left at prices higher than those fixed by the Government. Requirements of the Emergency Fleet Corporation are being tabulated and several thousand tons are expected to be required from this source shortly. The Southern iron market, which has been inactive since the Government regulation of prices, has taken on some life and several sales are reported for early shipment at regular prices. A sanitary interest has purchased 3000 tons of No. 1 Tennessee iron at $34.50, Birmingham. As Southern iron is shut out of price competition with Northern iron in this territory, all sales reported have been made to consumers who either use Southern iron exclusively or need it in their mixtures. The first sales of Ohio silvery iron since the Government regulation of prices were made during the week, orders for several lots of 8 per cent silvery, mostly for the first half delivery, being taken at the Government price of $46, at furnace. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62
Standard low phos., Valley furnace	58.00

Coke.—Foundry coke is in good demand for early shipment and some foundries are having trouble in getting a sufficient supply to keep running. This scarcity is also threatening to curtail production in two steel foundries engaged largely in Government work. Producers are so well sold up that but little coke is being offered for early shipment. We note the sale of 10,000 tons of standard Connellsville foundry coke for delivery through 1918 at $6 per net ton at oven, subject to price revision should the Government change present prices.

Finished Iron and Steel.—The demand for steel for Government work has increased, and a great deal of inquiry is coming from consumers for contracts for the first quarter and first half of next year, mostly for steel bars. While mills generally so far have declined to take contracts, consumers are now showing anxiety to

get under cover and it is expected that several mills will open their books to their regular trade within the next week or two for such tonnage as they will have to offer at the 2.90c. price for bars, the price not to be subject to revision should the Government fix a lower price Jan. 1. An Ohio maker of spark plugs who was inquiring a few days ago for 10,000 tons of steel bars for the first half is understood to have succeeded so far in placing only 2000 tons. An Ohio mill is now offering Bessemer steel bars for early shipment at 2.90c. In spite of reports of sales of hard steel bars in other localities at 2.90c., these are being sold in this territory at 3.60c. to 3.75c., or slightly lower than recent prices. Plates have eased off about $10 per ton in the local market for early shipment, now being quoted at 6.50c., Pittsburgh. New inquiries include one from France for 3000 tons. There is considerable inquiry for forging billets, for which mills are quoting $90. An inquiry for 6000 tons of forging billets for automobile axles for Government trucks is still pending. Among new inquiries for Government work is one for 500 tons of steel for ties for portable track and another for 1000 tons of tire steel for army wagons. The demand for bar iron is inactive and two local mills have been only partially operated for the past two weeks. The price of bar iron is unchanged at 4.50c., Pittsburgh. There is good inquiry for sheets, and the volume of sales has improved now that it is the general belief that sheet prices will not be fixed by the Government. Black sheets are quoted at 6c. to 7c., Pittsburgh, for No. 28, and there is a wide range of from 5.50c. to 7c. in quotations on No. 10 blue annealed. On galvanized sheets the market at present is fairly well established at 7.50c., although some mills are asking 8c. for No. 28. Consumers are anxious to cover for first quarter requirements but mills generally are declining to quote for that delivery, although one mill has made a quotation of 6c. for black sheets for the first quarter. Mills report that consumers are rather slow in taking sheet tonnage bought at the high prices recently prevailing. Warehouse prices are unchanged at 4.50c. for steel bars, 7c. for plates and 5c. for structural material.

Bolts, Nuts and Rivets.—The Government placed orders the past week for about 4000 tons of rivets, the bulk of the business going to Cleveland rivet makers and at prices from $5 to $7 per ton below regular quotations. Some of this business is understood to have been placed on a conversion basis. A new inquiry has come from shipyards for 6000 tons of rivets for 40 boats for the Emergency Fleet. The demand for bolts and nuts is heavy, being largely for Government work. Much of the Government business is special and makers are quoting on each inquiry according to the specifications. It is now generally understood that there will be no Government regulation of either rivet or bolt and nut prices. Rivet prices to the trade are unchanged at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts, subject to further discouts of 5 to 10 per cent for round lot orders, are as follows:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ¾ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—Information is being passed around in the scrap trade and given general credence that the Government will not regulate scrap prices if they remain around the present levels or are not advanced to the extent of bringing heavy melting steel to about the same level as pig-iron prices. The market is inactive and weak. Mills are still well supplied, so that there is no demand from consumers. However, there is some trading between dealers who are still covering on old sales. Dealers are engaged in looking after their old orders and are not making efforts to secure new ones from the mills, although some are making price concessions to move small lots of scrap quickly. Heavy melting steel is reported to have been sold as low as $26 but some sales are said to have been made at $28. Sales of grate bars and stove plate are reported at $16. Dealers' prices, f.o.b., Cleveland, are as follows:

	Per Gross Ton	
Steel rails	$26.00 to	$27.00
Steel rails, rerolling	36.00 to	37.00
Steel rails, under 3 ft.	30.00 to	31.00
Iron rails	35.00 to	36.00
Steel car axles	45.00 to	46.00
Heavy melting steel	27.00 to	28.00
Carwheels	26.50 to	27.50
Relaying rails, 50 lb. and over	50.00 to	60.00
Agricultural malleable	22.00 to	23.00
Railroad malleable	27.00 to	28.00
Steel axle turnings	21.00 to	22.00
Light bundled sheet scrap	20.00 to	20.50
	Per Net Ton	
Iron car axles	$44.00 to	$45.00
Cast borings	16.75 to	17.25
Iron and steel turnings and drillings	16.00 to	16.75
No. 1 busheling	22.00 to	23.00
No. 1 railroad wrought	34.00 to	35.00
No. 1 cast	23.00 to	23.50
Railroad grate bars	16.00 to	17.00
Stove plate	16.00 to	17.00

Cincinnati

CINCINNATI, Oct. 30. (*By Wire*)

Pig Iron.—An Indiana melter wants 2000 tons of foundry iron for delivery during the next eight months. A number of small inquiries are out for first half shipment, but very few orders have been booked the past week. As far as this year's delivery is concerned, the Northern and Southern furnaces have practically no iron to offer, and there is very little to be obtained in Virginia with the exception of some high silicon and manganese iron. A few foundry melters have purchased small tonnages of this special iron to enable them to increase the percentage of scrap used. There is some demand for the Ohio silvery irons, but no definite prices have been fixed, and only a few carload transactions have been reported lately. It is generally conceded that $33 at furnace represents the price on No. 2 foundry in all districts. Only a few furnaces in the South are able to take on any business for the last quarter, and the majority of them claim that their order books are fairly well filled for the first half of next year. Very little malleable iron is to be had, and melters have not yet been able to reach an agreement with producers as to what price should be charged. The general opinion now is that the Government, before taking any further definite steps, is permitting the seller and buyer to reach some agreement themselves as to differentials between grades. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 f'dry and 2 soft	$33.00
Southern Ohio coke, No. 2	33.00
Basic, Northern	33.00

(*By Mail*)

Finished Material.—An advance on wire nails of 30c. per keg made by a leading producer has not yet affected the local market, although it is freely predicted that the jobbers' price of $3.90 per keg, base, will soon be marked up. However, there is not much of a demand for nails from any source. Barb wire is also quiet, and the store price is $5 per 100 lb. Structural shapes are now firm at 5.15c. and steel bars at 4.65c. Flat bars, 2 x 1 in. and heavier, and also rounds 3 in. in diameter and over are quoted at 5c. Plates are unchanged at 7c., although very little business is reported. A radical reduction has been made on No. 10 blue annealed sheets that are now quoted from stock at 8c., base. The nominal quotation made by nearby mills on No. 28 black sheets is 7.65c., and on No. 28 galvanized 9.15c. Shipments are being urged forward by contractors of galvanized sheets at such a rate that it is extremely difficult for either jobbers or the mills to take on any new business for this year's delivery.

Coke.—Inquiries sent to Pittsburgh representatives for Connellsville foundry coke to be shipped this year are invariably returned with the information that no furnace or foundry coke can be obtained in that district at the Government's price of $6 at oven. It is stated on good authority that the ovens in all the producing districts are operating now at only 60 to 65 per cent capacity, which is just about sufficient to take care of contracts. The situation has not yet become acute with

local foundry users, but unless there is some change at an early date, a number of nearby plants may be compelled to shut down for want of fuel.

Old Material.—Careful estimates of the amount of business being done at the present time shows that the record is far below any similar period at this time of the year for a long time past. The dealers are naturally somewhat apprehensive as to what effect the proposed Government regulation will have on prices and they are buying very little scrap of any kind. Melters who need scrap iron for their different mixtures are only willing to purchase carload lots and at bargain prices. The figures given below are as close to the general average as can be obtained, but some of the quotations are necessarily only nominal. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

	Per Gross Ton
Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.50 to 25.00
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

	Per Net Ton
No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	22.50 to 23.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Birmingham

BIRMINGHAM, Oct. 29.

Pig iron producers are making little effort to sell their make, and delays in contracts are being noted throughout the district. Many old contracts are being worked on, and, it is stated, several months will be necessary to complete some of them. The spot market is inactive, except for a few sales being made to old customers of certain companies. The prices are those fixed by the Government. That manufacturers are not making any effort to sell their make is due, they assert, to the fact that they believe they will have a ready market when the opportunity comes. And they do not expect this opportunity for two or three months. Producers here declare that Northern furnaces, selling at the Government prices, will soon be sold out, and the Southern market will come into its own. Production is showing an increase. The Shelby Iron Co. has started two new furnaces, and the Little Belle furnace, relined and the capacity tripled, was blown in this week. Other companies announce tentative increases in production, and the prediction is made that November will witness the greatest output of any month this year. Steel production in the district is being pushed to the limit, and every ton is sold far in advance. The Tennessee company is pushing with all rapidity its new Fairfield works, but no prediction is made as to when it will be producing shapes and bars. Some rails and other shapes for domestic purposes are being rolled at the local mills, but the greater part of the production is for the Government and for the Allies.

Old Material.—The old material market is very quiet, and prices remain unchanged, as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
Heavy melting steel	20.50 to 21.50
No. 1 machinery	23.50 to 24.50
Car wheels	23.00 to 24.00
Tram carwheels	20.00 to 21.00
Stove plate	18.00 to 19.00
Shop turnings	11.00 to 12.00

Coke.—The coke production in the district is good. Coke producers insist that the Government price of $6, Connellsville, does not affect this district, and it is understood that not a few spot sales have been made at prices nearly, if not quite, as good as those prevailing before the announcement of Government regulation some weeks ago. However, practically none of the coke-makers is taking on any new contracts, due to uncertainty regarding this phase of the situation. In the meantime every effort is being concentrated on production, and it is declared that less coal production is the only thing that could cause a coke curtailment.

San Francisco

SAN FRANCISCO, Oct. 23.

The uncertainty as to the full effect of the Government regulation of prices is apparently as great as ever and serves to keep the local market in a very unsettled condition. A number of jobbers and mill agents have practically withdrawn from the market, and there is a general disinclination to name prices. Others who are still taking orders are doing so conditionally, and firm quotations are hard to get except for immediate delivery out of jobbers' stocks. As all the mills are sold far in advance, there is little prospect that steel will be delivered here at the new prices for a long time. Jobbers are doing some business out of stock, though the demand is generally light owing to the anticipated drop in prices. A good demand for wire nails at the old prices is reported.

Bars.—The demand for bars is still below normal on account of the expected recession in price. No orders for future delivery are being booked, but local mills have sufficient advance orders and contracts to keep them busy for some time. Jobbers are making sales out of stock at 6.50c. to 6.75c. for immediate delivery, but the quantities moving are small and no contracts for future delivery are reported.

Structural Materials.—Structural materials are reported as steady with nominally unchanged prices; but owing to the prevailing uncertainty no appreciable amount of business is being done. There is a lot of work in prospect and inquiries are numerous; but buyers are holding off until fabricators can get a line on Government needs and until the price question is solved.

Plates.—Practically the entire demand at the present time is coming from the Government. Prices are steady and unchanged. Some sales of floor plates at 8.75c., f.o.b. San Francisco, for eight and ten weeks' delivery are reported. These sales have been in single car lots. No figures on next year's delivery are quoted.

Sheets.—The movement in the price of sheets has been more marked than in any other material. Twice during the past two weeks the price has been reduced, the quotations of to-day being 1.50c. below those of two weeks since. For No. 28 gage, the present jobbing price here is 11c. At the lower prices, a good deal of buying is being done; and as jobbers' stocks are already low, they are expected to begin to replenish at an early date.

Wrought Pipe.—The Government regulations of steel prices have had no effect on the market here for tubular goods, and there has been no change in quotations. The demand from the oil fields remains heavy, but the principal demand is now coming from the various army cantonments and from the Coast shipbuilding plants. It is expected that the latter demand will increase as more new shipyards come into the market.

Cast Iron Pipe.—The local market for cast iron pipe has responded to the Government's action with considerably reduced prices; and it is thought that an active demand will develop, though at present there is little movement. Municipal work continues at a standstill, as Coast cities are making no attempts to float bonds in competition with the Government. Prices quoted to-day are: Class B., 6-in. and larger, $58 f.o.b. San Francisco; Class B., 4-in., $61; gas pipe, $62. There has been a considerable inquiry for shipment to the Orient, but as yet no business has resulted.

Pig Iron.—The market is very confused. Some buyers are paying about $50 for spot iron pending readjustment, and others have withdrawn altogether from the market. Few sales are being made, and no quotations can be considered as representing any considerable part of the trade, though a few dealers, fearing that a shortage of cars may prevent deliveries later, are ordering rather freely.

Coke.—All the larger foundries have long-term contracts for their coke, and they will not be affected by the readjustment of coke prices for some time. Brokers are quoting no prices, and such sales as are made are based entirely on telegraphic instructions from the East on the day of sale. Some coke has been sold for shipment to oversea American possessions. For these sales, prices of from $35 to $40 were paid.

Old Materials.—Receipts of scrap have fallen off. The market is now well supplied, though a shortage may develop later when the rains prevent the bringing in of supplies from a distance. The market is somewhat spotty, and there is a tendency to go below the quoted prices. Heavy machine cast iron is quoted at $33 to $35, with some sales made as low as $32 and bidders offering as low as $30. Stove plate has sold at from $24 to $25; heavy melting scrap at $27 and light country scrap at from $17.50 to $18.

St. Louis

ST. LOUIS, Oct. 29.

Pig Iron.—Inquiries continue to flow in for small tonnages of foundry iron, running, however, into a considerable aggregate, but furnace representatives are unable to do business because of the sold up conditions of their principals. Some of the resale concerns are beginning to sell iron at a higher price than commensurate with the Government figures, taking the ground that they are not affected by the agreement on price fixing. There is difference of opinion in the market on this question and it may take Government action to settle it. The Scullin Steel Co. has succeeded in getting 5000 tons of the basic for which it was in the market, but has taken Northern instead of Southern iron. It has also obtained 2000 tons of spiegeleisen for delivery over the next four months. Most of the large producers represented here declined to consider the business at any figure, because of the present situation. The inquiries coming in are in large part representative of the needs of small concerns, but there is a certain proportion indicating that they are sent out for the purpose of obtaining a price. The local furnace is not taking any new business at present, but is deferring acceptance of orders until later in order to develop its prices on a more definite foundation than exists at present.

Coke.—One sale of furnace coke of 2500 tons was made in the market during the week, but general business was still an uncertain quantity. There is doubt in the minds of representatives as to the price owing to the apparent non-existence of a differential between furnace and foundry grades. This is one of the problems to be ironed out. The local and near-by by-product producers are not at present in the market at any price.

Finished Iron and Steel.—No new business appears in finished products and the pressure for material on existing contracts is growing more severe. Stock out of warehouse is being adjusted to the fixed prices laid down by the Government and for material out of stock we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.45c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 8.05c.; No. 28 black sheets, cold rolled, one pass, 8.55c.; No. 28 galvanized sheets, black sheet gage, 9.55c.

Old Material.—While in some classes of material there is a better tone, there is, as a matter of fact, no increase of business and it is still a dealers' market, with the transactions depending entirely upon dealers' need to fill existing orders. Consumers are not inclined to take anything outside of what they have already contracted for and are apparently waiting for the settlement of the price fixing problem as to scrap before making anything more than immediately needed purchases. Dealers report increasing difficulty in getting cars and are handicapped by the unwillingness of customers to take any other than the usual equipment because of the unloading difficulties. Because of the situation, dealers are inclined to criticise some customers as not being patriotic in their recognition of the difficulties. Railroads are supplying open cars only under pressure. As some of the scrap is going to plants having Government contracts, efforts are to be made to get Federal action to aid the dealers in making deliveries on their contracts which are being held up by the attitude of the receivers. No lists appeared during the week, but a number are expected during the latter part of the current seven days. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows, with the reservation that the figures are estimates of value, the absence of transactions preventing the establishment of a real market:

Per Gross Ton	
Old iron rails	$36.00 to $37.00
Old steel rails, rerolling	35.00 to 35.50
Old steel rails, less than 3 feet	35.00 to 35.50
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old carwheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel	25.50 to 26.00
Ordinary shoveling steel	22.50 to 23.00
Frogs, switches and guards cut apart	27.50 to 28.00
Ordinary bundled sheet scrap	18.00 to 18.50
Heavy axle and tire turnings	18.00 to 18.50

Per Net Ton	
Iron angle bars	$34.50 to $35.00
Steel angle bars	24.00 to 24.50
Iron car axles	41.50 to 42.00
Steel car axles	39.00 to 39.50
Wrought arch bars and transoms	40.50 to 41.00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42 in. and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	15.50 to 16.00
No. 1 busheling	22.00 to 22.50
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	19.00 to 19.50
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipe and flues	20.50 to 21.00
Heavy railroad sheet and tank scrap	16.50 to 17.00
Railroad grate bars	17.00 to 17.50
Machine shop turnings	15.00 to 15.50
Country mixed scrap	15.50 to 16.00

Buffalo

BUFFALO, Oct. 29.

Pig Iron.—Inquiry for the week has been brisker and orders more frequent and of larger total than for the preceding week. One large producer reports sales of 6500 tons, 1000 tons of which was basic and the remainder No. 2 plain foundry, and another producer has sold an aggregate of 2000 tons of foundry iron for the week. The first of these two producers, which made the larger aggregate of sales, is, however, easing up in new business and confining sales to the taking care of old customer trade. The only drawback to the making of larger total sales in all grades of iron is the limited tonnage furnaces have to offer, and only one or two of them are in position to offer more than extremely small quantities. While some sales have been made for 1918 shipment, the preference of producers is to confine their offerings to prompt shipment and over the remainder of 1917, and not to sell for forward shipment beyond that time until it is definitely known what action the Government will take with reference to prices for the period after Jan. 1. Coke is practically unobtainable in any grade. Blast furnace interests, foundries and companies requiring coke for heating purposes are unable to find even as much as carload lots. As nearly as can be approximated the price schedule for the various grades of pig iron, f.o.b. furnace Buffalo, is as follows:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Mills and agencies are not taking on any new business other than for war materials, the attitude of both seller and buyer apparently being that neither desires to deal on business outside of classifications A and B for delivery after Jan. 1 until it is known on what basis the Government re-

vision of prices is likely to be made. A number of selling agencies report that inquiries for the past week have been greater in number than for any week in the past two months, although consisting principally of small tonnages of the materials sought for. One inquiry for a large tonnage, said to be artillery wheels for the Ordnance Department of the Government, was before the market, but so far as learned the order has not yet been placed. Mills are reported as crowded with work of classifications A and B. The leading interest announces that all warehouse material prices are now made f.o.b. the warehouse, instead of f.o.b. Buffalo. The Ferguson Steel & Iron Co., this city, has a contract for an 8-bay addition to the Watertown Arsenal, Watertown, Mass., now being constructed for the United States Government, requiring 350 tons of fabricated steel. The same company has also just received the contract for the fabricated steel for a machine shop to be built at the Watertown Arsenal, involving 1000 tons, and a contract for 500 tons of structural steel for a storehouse to be built in France by the United States Government.

Old Material.—Dealers are looking forward to a buying movement which they believe will be due when the decision in the matter of price regulation is arrived at by the Government, although there is as yet no intimation of the basis on which the scale of prices can be established. The uncertainty and delay in the fixing of prices and consequent sluggish interest in present buying, however, are having a tendency to cause prices to sag for such business as is being transacted, which is very limited in extent. Heavy melting steel, No. 1 railroad wrought, No. 1 railroad and machinery cast scrap, machine shop turnings, cast borings and old iron rails all show a further decline of $1 per ton as compared with last week's quotations, and low phosphorus a drop of $4 to $5 per ton. The scarcity and high price of labor are preventing the replenishing of yard stocks by dealers, even at reduced prices, and some lessening of stocks has been a consequent result. The exceeding difficulty of obtaining gondola cars is having a restricting effect on shipments and is hampering the completion of old contracts by dealers. We quote as follows, per gross ton, f.o.b. Buffalo, the prices for a number of commodities being nominal:

Heavy melting steel	$27.00 to $28.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	36.00 to 37.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	16.50 to 17.00
Heavy axle turnings	25.00 to 26.00
Clean cast borings	18.00 to 19.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

British Steel Market

Ferromanganese Sellers Scarce and Business Restricted—Pig Iron Strong

(By Cable)

LONDON, ENGLAND, Oct. 31.

Pig iron is generally strong with Cleveland iron in active demand but sellers reticent. Hematite iron deliveries are rigidly controlled. American semi-finished steel is idle and unchanged. Tin plates are quiet but firm. The scarcity of ferromanganese sellers is restricting business. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent. c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

(By Mail)

Output of Basic Iron Increasing—Ferromanganese Sellers fo America Few

LONDON, ENGLAND, Oct. 9.—The strain upon the country's resources is greater now than at any time since the war began. Official control has been tightened to a degree which has practically obliterated all merchant trading or a resumption of pre-war overseas activities.

The tendency of pig iron generally is strong, with home users readily paying full maximum prices, for demand has been intensified, and there is but little surplus material to meet additional export requirements. There is an ample supply of Cleveland iron to satisfy all home demands. The output of basic iron for steelmaking is being further added to at the expense of foundry grades. Iron foundries are busier and will be able to absorb the current output, but deliveries are impeded by lack of labor and trucks. Forge iron is wanted in larger quantities. Export business is more restricted pending further allocations. The hematite position is stringent, but should become easier due to additional capacity in the near future, although deliveries are still confined to urgent needs.

Semi-finished steel is unchanged, but is entirely governed by the continuous war requirements whereby the great bulk of current home output is taken up, keeping down the surplus for general purposes. Official prices remain undisturbed at £10 7s. 6d., delivered, for Welsh steel bars and billets. American material is practically a dead letter, the demand having been slack throughout, although there are no offers of billets and only limited quantities of wire rods in merchants' hands are obtainable at £28 to £29 c.i.f. Liverpool.

In finished steel there is a big accumulation of orders, and great difficulty is experienced in placing new business, especially for material intended for the merchant trade. Government requisitions are as heavy as ever, and there is no abatement of pressure of demand from shipbuilders in connection with new standardized boats. Where prices are controlled they are at the full maxima, while uncontrolled prices tend upward, though showing no great alteration. The market is badly congested and the impending Birmingham quarterly meeting will probably do no more than reaffirm recent stringent conditions. The Scotch works are practically swamped with orders, and overseas business is at a minimum.

Owing to steel restrictions the tin plate and sheet mills are kept going at much reduced capacity. The present output of the tin-plate mills is only about 30 to 35 per cent of normal. The market is featureless but distinctly firm, makers being pretty fully booked over the year's end and disinclined to take additional orders below the maximum basis price of 30s. per basis box for cokes, 20 x 14 net, at makers' works. A marked scarcity of heavy plates exists in contrast to light ones, for which slight concessions are made occasionally. Current output is barely sufficient to satisfy essential needs and substitutes have to be resorted to increasingly. Merchant business has been badly crippled and there is no hope of relief for an indefinite period.

The official order confirming the recent fixing of maximum prices for black sheets has not yet made its appearance, but there seems to be a little more business doing, while makers have become somewhat reconciled to the new conditions so far as the home trade is concerned. Some merchants are still quoting net f.o.b. prices as before, in the belief that the new regulations will not apply to export business, but there is not a great deal done in this direction. Orders for the home trade are being booked at the official price of £17 10s. for C. A. 24-gage sheets, net at makers' works, while the extra cost for painted sheets is 30s.

A few small orders for ferromanganese have been booked occasionally for Continental ports at £80 f.o.b. for loose for forward shipment. Business for America is kept in abeyance and c.i.f. quotations are rather easier at $350 to $375 for January-June shipment. The market, however, is firm on the whole with very few sellers. Indian manganese ores are firmly held at 3s. 5d. to 3s. 6d. per unit, but business is hindered by lack of freight.

The Irvine Sales Co., Minneapolis, Minn., is inquiring for five 60-in. boring mills, one 84-in. boring mill and one 60-in. x 14 to 18-ft. planer.

New York

NEW YORK, Oct. 31.

Pig Iron.—The demand for pig iron has quickly absorbed any tonnage offered by the furnaces, and it is becoming increasingly difficult to place orders, as furnaces are conserving what little iron they have to sell for the remainder of this year and the first quarter of next. This is particularly true of Virginia irons. There is a multitude of inquiries for spot delivery, ranging all the way from a carload or two to several hundred tons. Although several foreign nations, especially Italy, would be glad to get additional iron, foreign inquiries are in a quiescent state because of the uncertainty as to obtaining vessel capacity and the difficulty of getting permits to ship. The American Brake Shoe & Foundry Co. is in the market for about 2500 tons for shipment to its Central Western plants, and the Crane Co. for about the same tonnage for shipment to its Bridgeport, Conn., plant, deliveries to extend through the remainder of this year and the first quarter of next. The Crane Co. has covered for about a part of its requirements, the iron being understood to be somewhat below standard analysis. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 2 Southern	37.25
No. 2 X Virginia	36.50 to 36.75

Ferroalloys.—Both inquiries and sales of domestic ferromanganese are few. The market is considered stronger than last week at $275 for delivery this and next year, though a sale of about 200 tons at $250 is recorded as made under special conditions. Whether any more could be bought under $275 is doubted. Receipts from abroad are said to be growing smaller with deliveries on contracts considerably in arrears. Competition from the British alloy is becoming each month less of a factor so far as the future is concerned and price fixing of the domestic alloy is no longer expected. Spiegeleisen, 20 per cent, is quiet. The 12,000-ton inquiry before the market last week has not been awarded yet, but a sale of 500 tons for this year's delivery at $70, furnace, is noted. Ferrosilicon, 50 per cent, for this year's delivery is quoted at $175 per ton, with $150 as a minimum for 1918.

Finished Iron and Steel.—The slowness with which specific orders emanate from Washington for ship and shell material results in some mills being able to do a small volume of relatively prompt business. Naturally all of this is taken with stipulation that deliveries are subject to shelving on account of priority orders. The result has been some export business and exporters have sold steel bars at 4.25c. and sheets at close to 6c. Moderate amounts of plates seem to be obtainable at 5c. to 6c. per pound for export to buyers for which licenses are obtainable, as for Allied Government use. Bars from discard steel, suitable for reinforcing purposes, have sold at 3c. at mill. Considerable quantities of universal plates were taken at 3.25c., Pittsburgh, so that deliveries are now extended to two months or more. The 3 per cent transportation tax going into effect in November will need to be taken into account, making the freight rates substantially 0.201c. from Pittsburgh to New York, against the recently ruling rate of 0.195c. per pound, at least for sales on a f.o.b. mill basis. While the shipbuilding program will take possibly 2,000,000 tons more of structural steel in 1918, it is held that material will still be available for general building work. According to the Dow Service Building Reports, building costs to-day are not more than 30.7 per cent more than those ruling in 1914-15, and this fact on becoming known is encouraging building interests to push postponed projects. Meanwhile the large fabricated steel offerings continue to be for Government work, including 4500 tons for hangars at Langley Fields; 4000 tons for a machine shop at Washington and 1000 tons, awarded to the American Bridge Co., for the General Electric Co. at Lynn, Mass. Other work includes 200 tons for the Morse Dry Dock Co., Brooklyn; 450 tons for a new pier for the Robbins-Ripley Co., Brooklyn, and 170 tons for a bridge for the Long Island Railroad. About 150 tons all told have been awarded to the American Bridge Co., for the Delaware & Hudson and the Philadelphia & Reading. So far as business in Eastern territory is concerned the steel bars range from 2.90c. to 4c., Pittsburgh; shapes are obtainable in two or three months at 3c., Pittsburgh, and tank plates are nominal at 3.25c., Pittsburgh, but obtainable in small lots at 5c. to 6c., Pittsburgh. For mill shipments of iron bars we quote 4.945c., New York. Out of store we continue to quote shapes and iron and steel bars at 5c. to 5.50c., New York, and plates at 8c. and higher, with a possibility that 7c. might be done.

Cast Iron Pipe.—An occasional order for private contracts is placed, but no tonnage of importance has developed either from private sources or for public uses. The recently named prices of $56.50 on 6-in. and heavier, and $59.50 on 4-in. are maintained without difficulty on the limited business which is being transacted.

Old Material.—Keen interest was felt among dealers in this district in the proceedings of the meeting of scrap dealers at Pittsburgh last week, but no action as to prices was taken and the market remains in about the same condition of dullness as for a number of weeks, awaiting action by the Government in regard to prices. The only activity reported has been in cast scrap, on which prices are apparently somewhat higher, although reports in regard to quotations made on recent sales vary. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $25.00
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Re-rolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$26.00 to $27.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Pittsburgh

PITTSBURGH, Oct. 30.—(*By Wire*)

The sub-committee on tin plate is to meet with the Food Administration Board in Washington, D. C., on Wednesday, Oct. 31, and as a result it is expected that the Government price on tin plate will be announced this week. It is understood the tin plate manufacturers recommended the price of $8.20 per base box on tin plate, but the Government price is expected to be not higher than $7.75 per base box for tin plate made from Bessemer stock and $8 from open hearth stock for delivery over the first nine months of 1918. In regard to prices on other leading products, such as sheets, pipe, wire products, scrap and shafting, it is not known definitely at this writing whether the Government will fix prices on these products or not, but from reliable sources it is learned that probably the matter of further price fixing on these iron and steel products, and also on the lighter forms of finished iron and steel, will be left with the co-operative committee on steel and steel products of the American Iron and Steel Institute. The War Industries Board found it was a stupendous task to try to fix prices on the almost countless items of iron and steel and it has been practically decided to allow the American Iron and Steel Institute committee to work out these prices and submit them to the manufacturers for their adoption. This is not absolutely authenticated, but comes from sources that are in close touch with the situation. It is possible, however, that at the last minute the War Industries Board may decide to fix prices on sheets, wrought iron and steel pipe and boiler tubes, wire products, scrap and shafting, and then allow the institute committee to

work out the other prices. However, the fact that the American Steel & Wire Company last week readjusted its prices on wire products to a higher basis and that this same action may be taken on one or two other lines, leads to the belief that the whole matter of further price fixing may go up to the American Iron and Steel Institute co-operative committee. The whole trade is at sea and no one seems to have any definite idea as to how the problem of price fixing will be eventually worked out. In the meantime, new business on steel products on which prices have not yet been named is practically at a standstill, the buying trade simply holding off placing orders until the situation has cleared. The cold rolled strip steel manufacturers at their conference in Chicago last week reduced prices on large lots from 9c. to 7c. per pound, or $40 per ton. It is sincerely hoped that before this week ends, the price situation will have cleared to the extent at least that will permit consumers to start placing orders for material which they badly need.

Pig Iron.—There seems to have been less trouble in the adoption of the Government prices on pig iron than on any other commodity on which prices have been fixed. As soon as these prices were announced Sept. 24 leading producers here stated at once that they would adhere strictly to them and would not charge one cent more or less on any iron sold. This policy has been rigidly carried out and fair sized sales of all grades of pig iron have since been made at the agreed prices. In the past week there have been sales of 5000 tons of basic, 2500 tons and 2000 tons at the official price of $33 at furnace, and also a sale of 300 tons of off basic iron at $32.50 at furnace. We also note a sale of 2500 tons of Bessemer and one of 1500 tons at the official price of $36.30 at valley furnace. There have also been sales of 3000 to 5000 tons of No. 2 foundry iron at the official price of $33 at valley furnace, and several leading producers of foundry iron have advised their larger consumers that they will take care of their needs at the $33 price. There is a scarcity in the supply of Bessemer and basic iron, due largely to falling off in output on account of shortage in coke.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—No sales of billets by the steel mills at the Government price of $47.50 or of sheet bars at the $51 price have been reported. It is said that on inquiries for billets and bars submitted to the mills the prospective buyers are advised that the mills are sold up on contracts and have no steel to sell for delivery this year. It is said some consumers would be willing to pay an advance over the Government price for billets and sheet bars to obtain quick delivery. Several concerns here that formerly handled large quantities of billets and sheet bars say they have not made a single transaction since the Government prices were announced on Oct. 4, and they do not expect to handle any steel for some time to come. They state the mills advise them they have no steel to spare, needing their entire output to apply on contracts with regular customers. We quote soft Bessemer and open hearth billets at $47.50 and sheet bars at $51, Pittsburgh or Youngstown mills. We omit quotations on forging billets, as the differentials on these have not yet been established.

Ferroalloys.—The trade is awaiting some announcement from the Government or other source as to prices on the different grades of alloys, which has not yet come out, and as a result there is practically no new buying. Domestic 80 per cent ferro-manganese is held at about $300 per ton, delivered, for prompt or future shipment. We quote 18 to 22 per cent spiegeleisen at about $70 and 50 per cent ferrosilicon in carload lots at $140 to $150, delivered, lower prices being made on 100-ton lots and over. As yet, prices on Bessemer ferrosilicon and silvery iron have not been officially promulgated, and until these come out we omit quotations.

Structural Material.—The local market is extremely quiet and has been for some time. Local fabricators are turning out a great deal of Government work, details of which are withheld. The McClintic-Marshall Co. has taken 1500 tons of bridge work for the Philadelphia & Reading Railroad, and about 1000 tons for a new steel building for the Reading Iron Co., Reading, Pa. The Jones & Laughlin Steel Co. has taken about 250 tons for binders for a large open hearth steel furnace for the Erie Forge Co., Erie, Pa. We quote beams and channels up to 15-in. at 3c. per lb. f.o.b. Pittsburgh.

Plates.—Most of the new buying in plates is on Government direct or indirect orders, the demand from the domestic trade being quiet. The formal order for 30,000 8-wheel cars to be bought by the Government for Russia has not yet been placed. Some new inquiries from domestic railroads for cars have recently come out, the first in a long time. The Pennsylvania Railroad is inquiring for 1000 70-ton coal cars, the Union Pacific for 500 50-ton underframe flat cars, 1000 50-ton steel hoppers, 1000 50-ton all steel drop bottom gondolas, 1000 40-ton steel underframe stock cars, 1000 logging trucks, 200 oil tank cars and 50 cabooses. The Seaboard Air Line has an inquiry out for 500 box cars, the Central Railroad of Georgia for 500 box cars, the Illinois Central for 1000 steel hoppers, and the Western Pacific for 1000 box cars. As to whether these contracts will be placed is a question, but if they are, delivery will no doubt be greatly deferred, as the Government order for 30,000 cars for Russia, if placed, will have priority. Some sales of plates have been made at the Government price for fairly prompt delivery, and these are getting more numerous. We quote ¼-in. and heavier sheared plates at 53.25c. at mill f.o.b. Pittsburgh.

Steel Rails.—We do not hear of any new orders being placed for light rails or standard sections, aside from several Government orders said to have been placed lately for both standard sections and light rails for shipment to France. Prices on light and heavy section rails are given on page 1091.

Sheets.—To-day (Tuesday) a general meeting of all manufacturers of black and galvanized sheets is being held in the William Penn Hotel in this city, for the purpose of considering the present situation in the sheet trade, and to devise some means of putting it on a more satisfactory basis, if possible to do so. It was expected that three weeks ago, or more, the Government would announce prices on sheets, but up to this time has not done so, with the result that makers and consumers of sheets alike are in the dark, and do not know how to proceed. Several weeks ago, a committee of sheet manufacturers submitted to the War Industries Board, prices on sheets which they believed were fair to the mills and to consumers. It is understood these prices were 4c. for blue annealed sheets, 5c. for Bessemer black, and 6.25c. for galvanized, all of No. 28 gage, Bessemer stock, an advance of 25c. per 100-lb. to apply on open hearth stock. It was fully expected that very shortly after these prices were submitted, the Government would announce prices on sheets, but this has not been done, and now there is some doubt whether the Government intends to name prices on sheets, or allow the market to adjust itself to a lower basis, taking into account the $51 price on sheet bars announced by the Government on Oct. 4. In the meantime, the market on sheets is considerably lower, sales of No. 28 Bessemer black having been made as low as 5.25c., and mills are perfectly willing to sell at 6c. or lower. Until something more definite is known as to the actual market, we have reduced prices on blue annealed sheets 3c. per lb., No. 28 Bessemer black the same, galvanized 2c. per lb., and tin mill black 2c. per lb. However, it should be understood that these prices are purely nominal, and are only given for the purpose of record. They will be found on page 1091.

Tin Plate.—The sub-committee on tin plate, consisting of J. I. Andrews of the American Sheet & Tin Plate Co., E. R. Crawford of the McKeesport Tin Plate Co., and E. T. Weir of the Phillips Sheet & Tin Plate Co., will be in conference on Wednesday, Oct. 31, with the Food Administration Board at Washington, D. C., and as a result of this meeting, it is probable that the price on tin plate for delivery in the first nine months of 1918 will be announced by the Government. It is

stated that the price submitted by the tin plate manufacturers to the Food Administration Board for delivery over the first nine months of 1918 was $8.20 per base box at mill, but whether this price will be accepted by the Food Administration Board is not known at this writing. It will be recalled that the price on sheet bars of $51, made by the Government on Oct. 4, is effective only for the present quarter, being subject to revision on Jan. 1, or after. The manufacturers of tin plate take the ground that they must be covered on sheet bars at a definite price for the first nine months of 1918 if they are to sell tin plate for that period. While, as stated above, the price of $51 is good only until Jan. 1. This is one of the complications that came up in the effort to try to fix a price on tin plate for delivery the first nine months of next year. It would be useless for the Government to fix a price on tin plate for this year, as none of the manufacturers has any to sell for that period, and they will have very little to sell for first quarter of 1918.

Wire Products.—A general meeting of manufacturers of wire products was held in Chicago on Monday, Oct. 29, and is understood to be still in session to-day (Tuesday). Some complications have come up in the effort to settle on a Government price for wire and wire nails. Just how this will work out is a question. As noted last week, the American Steel & Wire Co. readjusted its price on wire products to the basis of $3.50 for wire nails; $3.25 for fence wire; $3.65 for polished fence staple; $4.35 for galvanized fence wire; $3.65 for painted barb wire and $4.35 for galvanized barb wire. However, these prices were not sent out generally to the trade, and, we are advised, have not yet been officially promulgated by the company. The adoption of these prices by the American Steel & Wire Co. was done for the purpose of removing certain complications encountered by the Government in fixing prices on wire products. As a result of the meeting in Chicago it is possible that another general adjustment in prices on wire products will be made by all the mills, so that their prices will all be on a uniform basis. However, this is surmise, as nothing definite is known at this writing as to what action was taken at the Chicago meeting or may be taken before it adjourns. Some of the independent mills have sold wire and wire nails at the price adopted last week by the American Steel & Wire Co., but this was not general by any means. Until more definite information is obtained as to the action taken at Chicago, and what may be done by the Government, we simply repeat the former nominal prices of the independent mills on wire and wire nails, which are given on page 1091.

Iron and Steel Bars.—The mills are more generally quoting the new price of 2.90c. on steel bars, but have very few to sell for delivery this year. No definite change has yet been made in prices on iron bars, but it is expected these will soon be readjusted to put them more in line with prices on steel bars. Some mills rolling steel bars have their output sold up for months ahead, and have not quoted the new Government price of 2.90c. Nominal prices on iron and steel bars are given on page 1091.

Cold Rolled Strip Steel.—At the conference of manufacturers of cold rolled strip steel held in Chicago last week, prices on contracts were reduced from 9c. to 7c. per pound, small lots ranging from 8c. to 9c. per pound at mill. Terms remain 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more. It is not known at this writing whether it is the intention of the Government to name prices on cold rolled strip steel, and it is the general belief here that it will not do so, but possibly revised prices on cold rolled strip steel may come later from one of the subcommittees of the American Iron and Steel Institute.

Wrought Pipe.—This is also one of the items on which the Government has been expected for three weeks or more to name prices, which have not yet come out. Some complications came up in the effort of the War Industries Board to name prices on iron and steel pipe, and these have not yet been adjusted. It is still expected that either the Government, or the mills themselves, will announce prices on iron and steel pipe as represented in the discount adopted on May 1 by the independent mills, and which are still in effect, with the exception that the LaBelle Iron Works and Wheeling Steel & Iron Co. are naming higher prices. Discounts of the National Tube Co. have not been changed since April 1, and its prices on wrought steel pipe have been $12 per ton lower than those of the independent mills that adopted the May 1 card.

Coke.—There is still a good deal of dissatisfaction among consumers of blast furnace and foundry coke over the methods being used by some of the coke producers to evade making sales of coke at the Government price at $6 per net ton at oven for furnace and foundry. It is said that some of the practices of a few of the coke operators have placed them in the position of being liable to prosecution, and that some of their acts will not stand close Government scrutiny. On the other hand, some of the larger coke operators are filling to the absolute letter their obligations on coke, and customers who have open contracts for furnace coke at $6 per net ton at oven, are receiving regular supply and have no cause for complaint whatever. It is said that in order to secure furnace coke promptly, old contracts at $8 and $8.50 have been extended, and that coke is being shipped in this way that nets the operators $2 and even $2.50 more than the Government price. It is true the supply of cars is bad, but at the same time it is large enough to permit freer shipments of furnace coke than are being made. Some users of furnace coke, who claim they are not receiving fair treatment, threaten to take proceedings unless certain sharp practices are speedily stopped. We quote standard grades of furnace and foundry coke for prompt or future shipment at $6 per net ton at oven. The *Connellsville Courier* gives the output of coke in the Connellsville regions for the week ending Oct. 20, as 346,239 tons, an increase over the previous week of 7237 tons.

Old Material.—There is absolutely no change to note in the situation in the local scrap trade over that given in this report for several weeks past. A large meeting of scrap dealers from all over the country was held in this city on Thursday, Oct. 25, but no definite action was taken that seemed to clarify the situation as regards prices on scrap. It is understood that the subcommittee on scrap iron suggested to the War Industries Board that a fair price to dealers and consumers of steel scrap would be $25 and other grades in proportion, but it is not definitely known whether the Government intends to name prices on scrap or not. In the meantime, practically no material is sold by dealers to consumers, the latter holding off placing orders until the situation as regards prices is clearer. In this condition nothing remains to do but repeat former prices, which are purely nominal. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

IRON AND INDUSTRIAL STOCKS

Campaign for Liberty Bonds Detracts from Interest in Stocks

NEW YORK, Oct. 31.

The close of the great campaign for the second Liberty loan dominated the stock market last week and interest on the Exchange lagged, so that the week's transactions were less than 60 per cent of those of the previous week and only 35 per cent of the total for the corresponding week last year. There was great irregularity, beginning with a reaction Monday, uncertainty Tuesday, with declines of most securities and about the same condition on Wednesday when there was only a half day's session, owing to the observance of Liberty Day, further declines, mostly in railroad shares Thursday, and a decided improvement Friday, when the success of the loan was assured.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal. com..	19½ - 22⅛	Int. Har. Corp., com.	58 - 63
Allis-Chal. pf....	73⅞ - 75	Lack. Steel	77 - 81¼
Am. Can com...	39 - 43⅛	Lake Sup. Corp.	12¾ - 13¾
Am. Can pf.....	97 - 98	Lukens 1st pf.	101½ -
Am. Car. & Fdry. com.	62⅞ - 68	Midvale Steel	43½ - 46¾
Am. Car & Fdry. pf	107½	Nat.-Acme.	29⅞ - 30½
Am. Loco. com..	55⅛ - 59¼	Nat. En. & Stm. com	37 - 44⅛
Am. Loco. pf....	98¾ - 98⅞	N. Y. Air Brake.	107 -114
Am. Rad. com...	292 -295	Nova Scotia St..	75⅝ - 79
Am. Ship com..	89¼ - 90½	Pressed St. com.	54⅞ - 58
Am. Steel Fdrys.	58 - 62⅞	Ry. St. Spring com.	40 - 42½
Bald. Loco. com.	56¾ - 63	Ry. St. Spring pf.	96
Bald. Loco. pf..	95½ - 95⅞	Republic com.	74¾ - 81⅛
Beth. Steel com.	79¼ - 87	Republic pf.	98⅜ - 98½
Beth. Steel, Cl. B.	78⅜ - 86⅞	Sloss com.	39¼ - 40¾
Beth. Steel pf.	91	Superior Steel.	36½ - 37
Cambria Steel	115	Transue-Wms.	38 - 39
Central Fdry. com.	30	Un. Alloy Steel..	39⅞ - 40
Central Fdry. pf.	41	U. S. Pipe com..	13 - 13¾
Chi. Pneu. Tool.	54½ - 55	U. S. Pipe pf....	50 - 50½
Colo. Fuel	36⅜ - 39¾	U. S. Steel com..	101¾ - 107
Crucible St. com	61½ - 68	U. S. Steel pf...	112¾ - 114
Deere & Co. pf..	99 - 99¾	Warwick	9
Gen. Electric....	128 - 137¼	Westing. Elec. ..	40¾ - 42½
Gt. No. Ore Cert.	26½ - 29		
Gulf States Steel.	93¼ - 97		
Int. Har. of N. J. com.	102 - 105		

Dividends

The Atlantic Steel Co., 3½ per cent on the preferred, payable Nov. 1.

The Pressed Steel Car Co., quarterly, 1¾ per cent on the common, payable Dec. 5, and 1¾ per cent on the preferred, payable Nov. 26.

The Stewart-Warner Speedometer Co., quarterly, 1½ per cent, payable Nov. 15.

The Superior Steel Corporation, quarterly, 2 per cent on the first and second preferred, payable Nov. 15.

STEEL CORPORATION EARNINGS

Report Shows Some Decrease in the Third Quarter—Extra Dividend

The report of the United States Steel Corporation for the quarter ending Sept. 30 shows very handsome earnings, but a decline as compared with the preceding quarter. After allowing $63,733,013 for war income and excess profits taxes, the earnings were $68,243,784, compared with $85,817,067 for the same quarter in 1916 and $38,710,644 in 1915. An extra dividend of 3 per cent, the same as in the two preceding quarters, was declared on the common stock in addition to the regular quarterly dividend disbursement of 1¼ per cent. The directors also declared the regular quarterly dividend of 1¾ per cent on the preferred stock. The earnings for the past 11 quarters have been as follows:

	1917	1916	1915
First quarter	$113,121,018	$60,713,624	$12,457,809
Second quarter	90,579,204	81,126,048	27,950,055
Third quarter	68,243,784	85,817,067	38,710,644
Fourth quarter	.....	105,968,347	51,232,788

In the quarter ending June 30 the Steel Corporation reported net earnings of $90,579,204 after allowing $53,918,872 for war taxes; hence the earnings for that quarter would have been $144,478,076, while for the last quarter they would have been $131,976,797 except for the wax taxes. The decrease of about $12,500,000 in net earnings reflected the slackening in the industry, due largely to uncertainty concerning the Government's attitude on prices, but in part to the inability to keep up production on account of inadequate coke supply. The comparison of monthly earnings shows that the greatest were in June, 1917, when they amounted to $31,284,562. In the last quarter, September had the lightest earnings. The total surplus of the nine months ending Sept. 30 was $80,962,547.

Statement of United States Steel Corporation and Subsidiary Companies for the Quarter Ending Sept. 30, 1917.

EARNINGS.

	Earnings before charging interest on the subsidiary co.'s bonds outstanding.	Less: Interest on the subsidiary co.'s bonds outstanding.	Balance of earnings.
July, 1917	$23,500,463	$739,795	$22,760,668
August, 1917	24,287,844	739,119	23,548,725
September, 1917	22,673,788	739,397	21,934,391
	$70,462,095	$2,218,311	

Total earnings after deducting all expenses incident to operations, comprising those for ordinary repairs and maintenance of plants, allowances for estimated proportion of extraordinary cost of facilities installed by reason of war requirements, also taxes (including $63,733,013 for account of war income and war excess profits taxes), and interest on bonds of the subsidiary companies		$68,243,784
Less, charges and allowances for depreciation, applied as follows, viz.:		
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies	$11,159,843	
To sinking funds on U. S. Steel Corporation bonds	1,838,564	12,998,407
Net income		$55,245,377
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,288,436	
Premium on bonds redeemed	224,612	5,513,048
Balance		$49,732,329
Dividends on stocks of the United States Steel Corporation, viz.:		
Preferred, 1¾ per cent	$6,304,919	
Common, 1¼ per cent	6,353,781	
	$12,658,700	
Extra dividend: Common, 3 per cent	15,249,075	27,907,775
Balance of surplus for the quarter		$21,824,554
Net surplus reported for six months ending June 30, 1917	$71,854,717	
Less, additional allowances for first half of 1917, for war income and war excess profits taxes pursuant to Revenue Bill as finally passed	12,716,724	
Balance of surplus for six months ending June 30, 1917		59,137,993
Total surplus for nine months ending Sept. 30, 1917		$80,962,547

Superior Steel Corporation Financial Report

The Superior Steel Corporation, Union Arcade Building, Pittsburgh, works at Carnegie, Pa., has issued the following statement of income for the eight months ending Aug. 31:

Shipments: Net Tons	Shipments: Value	Cost of Shipments	Profit
68,407	$7,291,021.39	$4,782,060.85	$2,508,960.54

Gross manufacturing profit		2,508,960.54
Miscellaneous income		39,711.59
Gross income		$2,548,672.13
Deductions from income:		
Administrative expenses	$70,898.06	
Selling expenses	107,873.52	
Discount on sales	89,595.00	
Taxes	31,467.30	
Plant depreciation	124,476.18	
Reserve for accounts receivable	2,250.00	
Charter and organization expenses (written off)	7,740.20	
Contribution to American Red Cross	15,000.00	449,300.26
Net income Jan. 1 to Aug. 31, 1917		$2,099,371.87
Add net income Dec. 26-Dec. 30, 1916		29,895.02
Total net income		$2,129,266.89
Disbursements and appropriation of earnings:		
Dividends paid by Superior Steel Corporation	$260,016.00	
Reserve for common stock disbursements, Dec. 26, 1916, to May 31, 1917	155,000.00	
Additional reserve for Excess Profit Tax	577,946.76	992,962.76
Balance Aug. 31, 1917		$1,136,304.13

In connection with the above, E. W. Harrison, president of the corporation, made the following statement:

The Superior Steel Corporation has been extremely careful, particularly in recent months, not to overreach itself, and has built up a very strong cash position. It has already made provision to take care of all estimated war profits and income taxes, and its position is such that working capital will be ample for all purposes after making due allowance for depreciation, and dividends on both preferred and common issues. We believe the 6 per cent rate being paid on the latter to be conservative in view of the large earnings and strong position of the company. The company has no maturing obligations either in the form of notes or bank loans, and no financing operations of any sort will be necessary. Inasmuch as the company has a contract running for eight years to come for all the coal it needs at a very favorable price, and owns its own coal cars in which the supply is hauled a distance of only 16 miles from the mines, there is little likelihood of any trouble on this score, either on account of price or difficulty in securing delivery. The labor situation is quite satisfactory and the company's needs in the matter of raw materials are better covered at the present time than for many months.

Pittsburgh Steel Co. Annual Report

The annual report of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has been issued for the fiscal year ended June 30, 1917. All the plants of the company were operated continuously through the year to maximum capacity. The net sales for the year were $33,066,083.48, as against for the previous year $21,848,035.67, an increase of $11,218,047.81. The net profits for the year (after setting aside $1,507,278.58 for depreciation of plants and for extinguishment of mines, and $1,823,548.16 for estimated war profits tax) were $7,811,444.19; which, compared with the previous year, $4,564,067.18, shows an increase of $3,247,377.01.

The products of your company shipped during the year, compared with the preceding fiscal year, were as follows:

	1916-1917	1915-1916
Pig iron and billets	$11,867,999.52	$5,364,608.42
Hoops, bands and cotton ties	2,618,274.70	1,260,842.15
Wire rods, plain wire, nails, fencing, etc.	17,387,285.18	14,506,901.88
	$31,873,559.40	$21,132,352.45
Miscellaneous products	1,192,524.08	715,683.22
Totals	$33,066,083.48	$21,848,035.67

SUMMARY OF RESULTS

The available cash of the companies was increased from the following sources:		
Profit from operations of all companies		$7,811,444.19
Amounts charged to operations not represented by cash expenditures		3,650,996.84
Increase in accounts payable		363,947.09
Decrease in bills receivable		28,075.86
Sale of re-acquired securities		10,100.00
		$11,864,563.98
Of this sum there was applied in reduction of liabilities as follows:		
Coupon gold notes	$2,384,000.00	
Less appropriation therefor at June 30, 1916	1,019,378.32	
	$1,364,621.68	
Further cash was required on account of:		
Increases in the following assets:		
Real estate buildings, etc.	$1,100,791.31	
Accounts receivable	732,900.15	
Inventories	1,987,120.08	
Bonds and stocks	742,045.24	
Loan	500,000.00	
Payments in advance	160,318.68	
Deferred charges	43,898.89	
	5,267,074.35	
Dividends paid	2,695,000.00	
		9,326,696.03
Leaving as the net increase in available cash		$2,537,867.95
Cash at banks and on hand, June 30, 1917	$3,541,464.89	
Cash at banks and on hand, June 30, 1916	1,003,596.94	
		$2,537,867.95

In his accompanying remarks to the stockholders, Wallace H. Rowe, president, said:

During the year there was expended for maintenance $1,265,506.22, and for bettterments and improvements $85,799.74, all of which was charged to operating expenses. The two open hearth furnaces under construction at the time of making last year's report were completed and put in operation—one on Oct. 8, 1916, the other on Nov. 6, 1916. From time to time during the year the output of the open hearth furnaces and finishing mills was reduced by reason of a lack of natural gas for fuel purposes, and as your directors were advised that probably the difficulties would continue and increase rather than diminish, the construction of a complete unit of gas producers for the twelve open hearth furnaces was authorized. The work is progressing satisfactorily, and it is expected will be sufficiently far advanced before cold weather sets in to materially improve this situation. The cost is estimated at $1,000,000.

"During the year your company purchased 90¾ acres of land in Washington County, Pa., about five miles from your Monessen works. Your company acquired during the year, on favorable terms, a large interest in the Bennett Mining Co. of Minnesota, which gives assurance of a better supply of ore for your blast furnaces. Reference was made in the report of last year to the remaining $2,000,000 of coupon notes of the company then outstanding, but called for redemption. All of these notes have been redeemed and the trust indenture securing same cancelled. On Jan. 2, 1917, the outstanding notes of the Pittsburgh Steel Ore Co., amounting to $375,000, were purchased from the holders, cancelled and the trust indenture terminated."

Regular quarterly dividend payments on the preferred stock of the company were made throughout the year. The regular quarterly dividends on the common stock likewise were paid, and, in addition, an extra dividend of 20 per cent.

Industrial Finances

The Luthol Research Laboratory Co., Columbus, Ohio, has increased its capitalization from $50,000 to $250,000.

Wheel Manufacturers Organize

About 45 manufacturers of wheels for use in the United States Army and Navy met last week at the William Penn Hotel, Pittsburgh, and organized a subcommittee of the Council of National Defense. The meeting was at the request of that organization and the sub-committee will co-operate with it to devise ways and means whereby the largest number of wheels may be manufactured in the shortest possible time. The committee appointed will be known as the Wheel Manufacturers' War Service Committee and is as follows: T. A. White, St. Marys Wheel & Spoke Co., St. Marys, Ohio; E. H. Archibald, Archibald Wheel Co., Lawrence, Mass.; H. F. Harper, W. K. Prudden & Co., Lansing, Mich.; O. B. Bannister, Muncie Wheel Co., Muncie, Ind., and O. W. Mott, Mott Wheel Works, Jackson, Mich. According to the manufacturers attending the meeting they have recently encountered considerable difficulty in obtaining proper material for the manufacture of wheels for Government service. This shortage, it is claimed, has resulted from the great increase in the manufacture of large trucks.

A Patriotic Appeal

Recently the United Engineering & Foundry Co., Pittsburgh, declared and paid a regular dividend of 2 per cent and an extra dividend of 4 per cent on its common stock. Accompanying the dividend checks sent to stockholders was an engraved card bearing an American flag, on which was printed: "It is the sacred duty of every American citizen to buy Liberty bonds to the fullest extent of his or her ability. With this divided in your hands, it is an opportune time to perform this sacred duty." The United Engineering & Foundry Co. has thus far this calendar year declared and paid a regular and extra dividend on its common stock to the amount of 23 per cent.

Owing to the shortage in the supply of coke, two blast furnaces at the Ohio Works of the Carnegie Steel Co., Youngstown, Ohio, have been banked, and Niles furnace of the same company at Niles, Ohio, has also been banked.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
Oct.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
24	23.50	23.50	61.75	5.50	5.37½	8.25	8.00
25	23.50	23.50	62.00	5.50	5.37½	8.25	8.00
26	23.50	23.50	63.00	5.50	5.37½	8.12½	7.87½
27	23.50	23.50	....	5.50	5.37½	8.12½	7.87½
29	23.50	23.50	65.00	5.50	5.37½	8.00	7.75
30	23.50	23.50	66.00	5.75	5.62½	8.00	7.75

NEW YORK, Oct. 31.

Copper is unchanged and nominal at the Government price. Tin is active and higher. Lead, after another decline, is very active and strong. Spelter is in poor demand and lower. Antimony has nominally declined.

New York

Copper.—The market is completely in the hands of the Copper Producers' Committee, with deliveries and sales regulated according to consumers' needs and with a view to protecting the Government and its Allies. Very little information as to the actual situation is available, most of the newspaper accounts being unconfirmed. No sales in a large way of either Lake or electrolytic are reported at the Government price of 23.50c. per lb., which we continue to quote as nominal. There is no official clearing up of the jobbers' or small consumers' difficult position but small lots continue to be sold at prices higher than the Government's. This phase of the market is easier, however, the prices paid more nearly approaching the official price than at any time. The London market is unchanged.

Tin.—The development of an acute shortage in spot tin, together with the uncertainty as to future supplies for small buyers, has caused the market to become active and higher. It has advanced daily until spot tin yesterday was quoted at 66c., New York, an increase of over 4c. in the week. The activity started on Thursday, Oct. 25, when good inquiries for early delivery appeared with but few sellers. Spot buyers became nervous, thus stimulating other positions, so that on Friday, Oct. 26, over 500 tons of all brands for all positions changed hands. Yesterday and Monday the spot situation became even more acute and was rendered more difficult by delayed cables which have continued late each day. A buyer for 50 tons could obtain only small lots when bidding up to 65c. on Monday and 66c. yesterday. Buyers are plentiful but sellers are few. Arrivals to Oct. 29, inclusive, have been 2060 tons with 4300 tons afloat. The London market has also advanced, spot Straits being quoted yesterday at £256 10s. per ton, an increase of over £9 in the week.

Lead.—Another drastic cut by the leading producer of 1c. per lb. on Wednesday, Oct. 24, bringing the quotation to 5.50c., New York, dumbfounded the entire market. The price has thus been halved in two months. It has been, however, a good thing for the industry and has had the effect evidently intended. Consumers and dealers, believing the bottom had been reached, started in to buy and since then purchasing has been on a large scale. At the end of last week prompt and November was selling at 5.50c. to 5.60c., New York. So far this week the market has continued to gain strength with sales still large. By yesterday independent sellers and others had withdrawn, leaving no one to supply the demand except the leading interest, whose quotation was and is still 5.50c., New York. Heavy sales yesterday pushed the price to 5.75c., New York, with a few sales reported at 5.87½c., New York. The cause of the present healthy tone is the fact that consumers' stocks have been at a minimum.

Spelter.—The market continues dull and uninteresting. In sympathy with the large decline in lead, prime Western spelter has also softened until yesterday the quotation was 7.75c., St. Louis, or 8c., New York, at which one or two 100-ton lots changed hands. Some few sales are also reported at 7.62½c., St. Louis, or 7.87½c., New York, but all sellers do not meet this price. Galvanizers and brass makers are still largely out of the market.

Antimony.—Chinese and Japanese grades are lower and in the absence of demand they are quoted nominally at 14.25c. to 14.50c., per lb., New York, duty paid.

Aluminum.—The market is easier with No. 1 virgin metal, 98 to 99 per cent pure, quoted at 37c. to 39c., New York.

Old Metals.—The market is very unsettled, as nobody seems to know what prices will be acceptable to the Government.

Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	21.00 to 21.50
Brass, heavy	18.00 to 18.25
Brass, light	12.00 to 12.25
Heavy machine composition	25.00 to 25.25
No. 1 yellow rod brass turnings	16.50 to 17.00
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	5.00
Lead, tea	4.25
Zinc	6.25

Chicago

OCT. 29.—Leading Chicago jobbers in copper are satisfied the Government has no intention of putting them out of business, or restraining them from selling at over 23.50c. when they must do so to get back what they have paid for their stocks, to say nothing of getting a fair profit. Their course is similar to that of jobbers in iron and steel. Considerable copper is being purchased, though it is not being widely distributed. Indications point to preparation by large melters for the shortages which usually come with winter and interrupted transportation. Lead is lower, and moving fairly well, although the independent producers are not meeting the price of the leading interest. For tin there is normal inquiry. Spelter is inactive, and antimony without interest. Old metals are quiet. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 64.50c. to 65c.; small lots, 66.50c. to 67c.; lead, 5.45c.; spelter, 7.62½c. to 7.75c.; sheet zinc, 19c.; antimony, 16c. to 17.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible wire, crucible shapes, 20c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 29.—Non-ferrous metals weakened somewhat during the early part of the week, but stiffened toward the close and to-day were quoted, in carload lots, as follows: Lead, 5.50c., with some producers asking 5.75c.; spelter, dull and nominal, at 7.87½c. In less than carload lots, the quotations were: Lead, 7c.; spelter, 8½c.; tin, 68c.; Lake copper, nominally, 27½c.; electrolytic copper, nominally, 27c.; antimony, Asiatic, 18c. In the Joplin district, ores were affected considerably by the condition in the metal market, with the result that the figures on the basis range in zinc blende, 60 per cent metal, were, although quoted at $55 to $70 per ton, really saleable at the lower end of the range to a greater extent than elsewhere, and the average for the district for the week consequently fell down somewhat to about $61.50 per ton. Calamine was in much the same condition, with the basis range for 40 per cent metal at $33 to $40 per ton and the district average for the week about $37 per ton. Lead ore was weak and sold down again to about $75 per ton, basis of 80 per cent metal, and the average for the district for the week was about the same figure. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 11c.; heavy yellow brass, 15c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 21.50c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; lead, 5.25c.; tea lead, 5c.

The Youngstown Sheet & Tube Co. still has one unit of 51 ovens at its Koppers by-product coke plant down for lack of coal.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c.; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb.; and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c, minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

(Prices of independent mills.)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $57; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ⅝ in., 7/16 in. and ½ in., $7 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.20; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31	2½ to 4	29	17
4 to 6	42	..	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	5.00 to 5.50
Nos. 9 and 10	5.25 to 5.50
Nos. 11 and 12	5.50 to 5.75
Nos. 13 and 14	5.75 to 6.00
Nos. 15 and 16	6.00 to 6.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	5.30 to 5.80
Nos. 22 and 24	5.35 to 5.85
Nos. 25 and 26	5.40 to 5.90
No. 27	5.45 to 6.00
No. 28	5.50 to 5.95
No. 29	5.55 to 6.05
No. 30	5.65 to 6.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	6.50 to 7.00
Nos. 12 and 14	6.60 to 7.10
Nos. 15 and 16	6.75 to 7.25
Nos. 17 to 21	6.90 to 7.40
Nos. 22 and 24	7.05 to 7.55
Nos. 25 and 26	7.20 to 7.70
No. 27	7.35 to 7.85
No. 28	7.50 to 8.00
No. 29	7.75 to 8.25
No. 30	8.00 to 8.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	5.80 to 6.30
Nos. 17 to 21	5.85 to 6.35
Nos. 22 and 24	5.90 to 6.40
Nos. 25 and 27	5.95 to 6.45
No. 28	6.00 to 6.50
No. 29	6.05 to 6.55
No. 30	6.05 to 6.55
Nos. 30½ and 31	6.10 to 6.60

Machine Tool Builders Vital Factor in War

Director General Japp of British Munitions Board Pays Tribute to Assistance American Trade Has Rendered the Allies—Association in Convention

"Without the machine tools of America, the Allies could not have reached their present dominating position," said Henry Japp, Deputy Director General in the United States for the British Minister of Munitions, in an address at the opening session of the annual convention of the National Machine Tool Builders' Association, Hotel Astor, New York, Tuesday morning.

Mr. Japp's address was one of the interesting and inspiring features of the convention. He said in part.

"I am sure you gentlemen who manufacture machine tools must all realize the great responsibility that rests on your shoulders to-day. Need I tell you how much the Allies, more especially the British Empire, appreciate the work that the machine tool builders of this country have done toward winning the war? In equiping the munition works of this country alone, you have done marvels; but when one considers the millions of dollars' worth of machine tools and accessories you have exported to Great Britain, France, Russia, Italy and Canada, it is surely with a deep feeling of gratitude that we must regard the great work you have accomplished; and let me say we still need your help, we depend on you, gentlemen, and we know you will not fail us. Every machine ordered over here by Great Britain is urgently required for munition work. So hurry, please hurry deliveries, and please don't forget that above everything the boys now at the front must be kept supplied, and to withhold their needs in any respect would be disastrous.

War of Machinery

"This is a war of machinery, of the building up in three years of a machine to smash the war machine of Germany that was surreptitiously built up in the last 40 years with malice aforethought to conquer the world. As you are aware, the Machine Tool Department of the British Ministry of Munitions is under the care of Sir Alfred Herbert, a well-known machine tool builder. In order to prevent machine tools standing idle or being insufficiently employed, he has established a machine tool clearing house. In the last seven months, his clearing house has investigated 22,000 applications and released 43,000 machines, which are valued roughly at $15,000,000. The production of munitions, of course, depends almost solely on machine tools, and you will be glad, and probably astonished, to hear that the output in England is to-day 20 times what it was two years ago. The Woolwich arsenal, which was our main supply in 1914, employed then a staff of 11,000, and the staff to-day is 74,000; and while in 1914 only 125 women were employed in this arsenal, there are now 25,000 employed there.

"The cost of the manufacture of munitions for Great Britain has resulted during the last year in a saving of $200,000,000 over the costs of production for the previous year, and workmen have been so prosperous that out of their savings they have contributed $200,000,000 to the war funds. The employment of women in the manufacture of munitions and the dilution of labor with women, in the case of machine work, amounts to as high as 60 per cent, and these women have been able to earn, working piece-work, 90 per cent in excess of the time rate. They are employed in all manners of industries, viz., gage making, machining shells, foundry moulding, glass blowing and shipbuilding, and of course agriculture. In the inspection of munitions, which employs some 50,000 people, 60 per cent are women, and in one large powder factory the proportion is 290 girls employed for each man worker. The above information is taken from the reports of Dr. Addison's speech in the House of Commons.

"It is encouraging to learn that the maimed soldiers are being carefully equipped with artificial limbs and trained as skilled workmen. Queen Mary's training workshop at Brighton has been particularly successful in this beneficent work as well as that at Roehampton. The problem of making the maimed soldiers independent of charity is a most important one, and the cheerful way in which these brave men have faced the problem of making themselves useful and independent is very inspiring. The perfection of the machine tool and modern methods has made possible the employment of maimed soldiers and women in countless capacities, thus relieving men who are physically fit for the more arduous work of the trenches.

Participation of the United States

"Now that this great country has enlisted with the Allies to destroy the destroyer in self-defense, final victory is assured. I am sure that you all realize that you are not fighting to save France or the British Empire but you are fighting in self-defense. It is your war as much as ours, and among other things victory will bring freedom to the German people in much the same way that George Washington, without knowing it, helped to bring freedom to the English people, and his victory in America over George III, the German King of England, established not only the democratic government of the United States but also of Great Britain and of the British Empire.

"With wonderful wisdom, President Wilson guided this country along the lines of strict neutrality until the people learned for themselves of the schemes of Germany to place this country, along with the rest of the world, under the heel of autocracy. Gradually the people were prepared for the great decision as bit by bit the evil intent of Germany was uncovered and revealed until the point was reached when President Wilson said: 'The time has come to conquer or submit; for us there is but one choice; we have made it.' And although to some it may seem to take a long time for your army to strike, make no mistake, this country is getting under way, it is like a huge flywheel, which takes time to reach its full speed and to develop its full energy, but ultimately becomes irresistible, overcoming all opposition in victory. The time will come for every country that is neutral to-day to decide whom they shall serve, as there appears to be no neutrality possible for country or individual in this war of right against might, of good against evil.

The Final Outcome

"When you consider that Great Britain has more than five million men under arms and that the United States has a population of more than double that of Great Britain and has practically unlimited resources, it is impossible to understand those who doubt that the final outcome will be the overwhelming defeat of Germany. The Germans have set up as their god military power and they worshipped this god for the last 40 years, giving it all their trust and faith, and now they are waking up to find that this false god of theirs cannot even feed them, let alone bring victory. They profess to be fighting for the freedom of the seas. The freedom they are aiming for is really nothing but license to murder and destroy while the freedom that America and the Allies are fighting for is the freedom for all controlled by will.

Future Outlook, Restoration

"As to the outlook after the war and the restoration that will be necessary, let us look forward with hope and courage. This is a wonderful time we are living in and a wonderful war we are waging, inasmuch as we are not only destroying the lust for conquest and

military power in Germany but throughout the world and we are setting ourselves and the peoples of the earth free from bondage to all manner of abuses.

"The employer and workmen, the rich and poor, the educated and the uneducated, are meeting in the trenches and spilling their blood together for the brotherhood of man, and in doing so are learning to admire and love each other, and can we doubt that a new Heaven and a new Earth are being revealed to-day and that the lookout is bright with promise.

"The business world is already preparing for the readjustment necessary by scaling down the excessive stock exchange values and plans are now under way to provide work for the returning soldiers after the war. If the British Army is disbanded at the rate of 40,000 men per week it will require three years for the work, but as arrangements are perfected, this work will no doubt be accelerated. Probably the same scale will apply to all the Allies. The skilled tradesmen should be released first so that by their industry there will be built up the supply of necessities that will be required for the devastated sections of France, Belgium and Servia, and to replenish the depleted stocks throughout the world.

"The machine shops of this country are the real reserves of the army. Napoleon would perhaps have called them his Imperial Guard. We can have a peculiar pride in knowing that upon our shoulders rests such a responsibility, and those of us who cannot go to the firing line can do our part back at our shops, because the fighting man is not the only one who must go over the top. We must do the same thing with good tools and plenty of them at greatest speed.

Increased Output

"But this war will end some time—no man knows when—and then the business man with a large plant and a large payroll will have some real questions to solve, requiring clear vision and courage. A prophet may indulge in predictions based on natural laws and past experience. Without, however, making any attempt at prophecy, I want to direct the attention of this membership to the fact that during the last three years there has been built about the same number of machine tools as would ordinarily be built in 10 years.

"They are, of course, through a process of long hourly service and a lack of skilled operators, being worn out more rapidly than usual, but even under such conditions the life of a well designed and well built machine tool is quite long. Therefore, I ask you, how long will it require the world market to absorb this over-supply which even now is apparent in some kinds of machine tools? Mind you, I am not predicting, simply calling your attention to a condition, with a view to having each manufacturer answer the question as best he can, but I would also like to add the old warning, 'the good sailor trims his sails for a squall.'

"This country has long been pre-eminent in the machine tool building industry, because we have cheap raw material, the inventive mind, labor efficiency and business organization. In the future, however, we must add additional qualifications, namely, we must further improve, we must grow more efficient, and we must deal with all nations in the same open-minded, honest, straightforward way. There must be no scraps of paper in our business dealings, no secret diplomacy, simply old-fashioned, dyed-in-the-wool, painstaking business transactions, which will permit us to extend our world trade to every country where a machine tool is used. In other words, in time of war prepare for peace.

"Our country needs our service now more than it ever has before. This terrific struggle means more than physical effort—it means strains of every kind, it means heavy taxes, it means personal sacrifices, it means work and lots of it—but I am quite sure that the machine tool builders of this country are fully equal to their task."

What the War Means.

An address on "What the War Means to American Business" was delivered at the Tuesday morning session by George E. MacIlwaine of Babson's Statistical Organization, Wellesley Hills, Mass. He dwelt upon the economic advantages which must result in European countries from the struggle. He urged American business men to prepare for a slump in business when peace comes, this to be followed by an era of peace prosperity, which may last, he said, from one to five years. After that, he predicted, is certain to come the worst period of business depression the civilized world has ever known.

Tuesday afternoon's session was devoted to five addresses on the prospects for foreign trade in machine tools after the war. R. Poliakoff, assistant professor of mechanical technology at the Technical Institute, Moscow, Russia, talked on Russia; E. G. Todd, member of the firm of E. Isberque & Co., Antwerp, Belgium, on Belgium; Roger P. Redier on France; Henry S. Moos, member of American Machinery Syndicate, New York, on Spain, and C. E. Briggs, National City Bank, New York, on South America. These addresses will receive more attention in the next issue of THE IRON AGE.

Committee meetings occupied all of Wednesday morning. At the Wednesday afternoon session an address was delivered by G. E. Merryweather, president Motch & Merryweather Machinery Co., Cleveland, who was lately appointed head of the machine-tool section of the War Industries Board.

Work to Be Done

"There will be endless work to be done after the termination of the war in construction and reconstruction so that all mankind will be fully and actively employed. The building of steamships to make up the curtailed building and losses sustained during the war will keep the shipyards busy for several years to come. The supplies required to reinstate the devastated industrial sections of France and Belgium, to say nothing of making up for the neglect in the up-keep of the British railroad systems and other public utilities on account of all facilities being impressed during the war for munition work will surely keep the machine-tool trade fully occupied for many years, especially as at present so much machinery is allowed to run without repair, and the same applies to all other industries that supply the needs of man.

"So let us look forward cheerfully to the future, inspired by the self-sacrifice that our boys are making for all we hold dear."

President's Address

The convention was called to order by the president, J. B. Doan, the American Tool Works Co., Cincinnati, who, among other things, said:

"It is a fitting time for instant and complete friendship among us—this is a day when we should knit our hearts together in a new and profound loyalty, which begins with our association and from there goes out to our beloved country. We need each other, and America needs all of us. As President Wilson has said: 'We must co-operate in the whole field of business, the Government with the merchant, the merchant with the employee, and all with each other.'

"Through this association and its membership our leaders at Washington have been able to quickly inform themselves of the condition of our plants, and every member, I am sure, has done his utmost to speed up shipments and to satisfy as best he could the Governmental requirements. Hours are extremely valuable in warfare; even minutes often win battles. Any machine tool builder who does not bend all his mental energy in the solution of the problem of rapid output is a lame soldier in the fighting line. We must literally spend sleepless days and nights, for we are the machines behind the men behind the guns. No machines—no guns.

The Bucyrus Steel Co., Bucyrus, Ohio, has been incorporated with a capital stock of $50,000. The company will make steel castings and different grades of alloy steel. The present authorized capitalization will be increased to a larger amount as soon as complete organization is effected.

PERSONAL

Charles T. Main, an industrial engineer, Boston, has been nominated for president of the American Society of Mechanical Engineers. Spencer Miller, Lidgerwood Mfg. Co., New York, has been nominated to one of the vice-presidencies. For managers, Fred A. Geier, president Cincinnati Milling Machine Co.; D. R. Yarnall, general manager Nelson Valve Co., Philadelphia, and Fred N. Bushnell, vice-president Stone & Webster Engineering Corporation, Boston, have been nominated. William H. Wiley, John Wiley & Sons, New York, who has been treasurer since 1884, has been renominated.

Randolph H. Fox, research engineer Fafnir Bearing Co., New Britain, Conn., has been commissioned a first lieutenant in the Ordnance Officers' Reserve Corps. Mr. Fox was graduated from the Massachusetts Institute of Technology in 1912.

A. W. Hatch, superintendent of the gun stock department, Remington Bridgeport Works, Remington Arms Union Metallic Cartridge Co., was tendered a banquet, Oct. 21, by 350 workers in his department. H. E. Wells, superintendent of the machine shop division, was toastmaster, and E. F. Ryan, assistant works manager, was one of the speakers. Mr. Hatch was connected with the gun stock department of the Springfield Arsenal for 15 years and later was in charge of the department at the Rock Island Arsenal.

Harvey M. Clymer, formerly connected with the Lebanon Valley Iron & Steel Co., Lebanon, Pa., has resigned to become chief clerk in the offices of Luria Bros. Co., dealers in iron and steel scrap, Park Building, Pittsburgh.

Carmi A. Thompson, who served two terms as secretary of state of Ohio, and was later private secretary to President Taft, has been made general manager of ore properties of the Tod-Stambaugh Co., Cleveland, and assumed his new duties Nov. 1. For several years he had been manager of the Great Northern ore properties, with headquarters at St. Paul, Minn.

Rollin C. Steese, a director and former general manager of the Brier Hill Steel Co., Youngstown, Ohio, has been named one of the five members of the advisory committee of the Ohio Fuel Administration.

C. O. Miniger has been named as vice-president of the Willys-Overland Co., Toledo, Ohio. He will devote his attention to the production department, in which he will be associated with William H. Birchall, general superintendent.

H. L. Hopwood, industrial lawyer, specializing in the negotiations and sales of industrial plants and businesses, has moved his office to the New First National Bank Building, Columbus, Ohio.

F. P. Bassett has been appointed superintendent of the blast furnace department of the Compania Fundidora de Fierro y Acero de Monterey, Monterey, Mexico. The company's furnace, of 300 tons capacity, was blown in on Oct. 3 and is to produce foundry and basic iron, using native raw materials.

H. E. Mills, superintendent of construction for the Buick Motor Co., Flint, Mich., in charge of building that company's new foundry, and later chief draftsman, has joined the organization of the H. M. Lane Co., Detroit, foundry and metallurgical specialists.

William A. Battey, who has been connected with the Shepard Electric Crane & Hoist Co. since its start in this field, as eastern sales manager and sales director, will sever his active connection with the business on Dec. 1, but will retain his interest in the company and continue as a director. He is vice-president of the Pennsylvania Crusher Co. and finds it necessary to devote his entire attention to its rapidly expanding business in the manufacture of hammer pulverizers, Bradford breakers and special crushing machinery for the by-product coke industry and other industries requiring reduction apparatus. W. C. Briggs, for the past ten years associated with Mr. Battey in the Shepard company's New York office as sales engineer, will become district manager. On Nov. 1 Robert T. Turner will join the New York organization as sales engineer, at 30 Church Street.

E. R. Swanson, assistant superintendent of the Duquesne Steel Foundry Co., Coraopolis, Pa., has been appointed superintendent of the plant, succeeding L. A. Way, resigned. Mr. Swanson was formerly with the Commonwealth Steel Co., Granite City, Ill.

James A. Freed, employment agent for the Youngstown, Ohio, district Carnegie Steel Co. mills, has been named also land agent for the company in that district, having directly in charge the sale and rental of houses being erected at McDonald, Ohio, where the new bar, hoop and band mills are being built.

J. Mathews has been appointed general superintendent of the Standard Steel Castings Co., Cleveland.

R. J. Morgan has been appointed supervisor of sales of the American Steel Export Co., New York. He has been identified with the Midvale Steel & Ordnance Co., following thirteen years with the Carnegie Steel Co.

Jonathan Warner, president of the Trumbull Steel Co., Warren, Ohio, has been elected president of the Y. M. C. A. of Youngstown, Ohio.

J. D. W. Snowden, who for about 15 years has been connected as salesman with the Cleveland sales office of the Cambria Steel Co. and its successor, the Midvale Steel & Ordnance Co., has resigned to become associated with the sales department of the American Steel Export Co., New York. He has been succeeded by G. W. Pratt, who for a long time has represented the Cambria company in Toledo, Ohio.

R. C. Garlick will leave Chicago Nov. 1 to assume a position in the sales department of the Sharon Steel Hoop Co., at Sharon, Pa. S. J. Mertz, who has been connected with the Sharon and Chicago offices for a number of years, will succeed Mr. Garlick as city and traveling salesman from the Chicago office.

W. T. Pursglove has become manager of the Lindholm Metal Stamping Co., Front and Erie Streets, Camden, N. J., manufacturer of grease cups and kindred specialties.

Charles N. Replogle, general manager, Ralston Steel Car Co., Columbus, Ohio, has resigned to become vice-president and general manager of the Symington Forge Co., Rochester, N. Y.

William C. Hood, South Brownsville, Pa., has been appointed assistant general superintendent at the plant of the H. C. Frick Coke Co., with headquarters at Scottdale.

Allen Hoffer, Coatesville, Pa., superintendent of blast furnaces for the Worth Brothers Co., has resigned, effective Nov. 15, to become associated with the Cleveland-Cliffs Iron Co., Cleveland.

At the annual meeting of stockholders of the Columbia Wagon Co., Columbia, Pa., manufacturer of wagons and parts, W. T. Garrison was elected president and H. F. Yergey, treasurer and manager. Edward B. Smith is secretary.

F. L. Converse, electrical engineer for the Midvale Steel Co. at its Coatesville, Pa., works, has resigned to become connected with the Tacony Ordnance Co., Philadelphia.

William S. Quigley, president Quigley Furnace Specialties Co., Inc., New York, will address the Brooklyn Engineers' Club on Thursday evening, Nov. 1, on the "Use of High Temperature Furnace Cement in Furnace Construction," illustrated by means of an electric furnace in operation.

Charles Piez, president Link-Belt Co., Chicago; Charles Day, Day & Zimmermann, Philadelphia, and Arthur Mason, have been appointed as a special committee by President Capps of the Emergency Fleet Corporation to make a survey of shipyards in the country and suggest ways of increasing efficiency.

The War Excess Profits Tax Problem

WASHINGTON, Oct. 30.—The Internal Revenue Bureau has been swamped with inquiries concerning the proper interpretation to be put on the provisions of the war excess profits tax as found in title II of the war revenue act of Oct. 3, 1917. After an ineffectual attempt to frame a series of rulings covering the most important of the questions that have arisen, Secretary of the Treasury McAdoo announces that he will appoint an Advisory Board to assist the Commissioner of Internal Revenue in construing and applying the excess profits provisions. In the meantime the bureau will refrain from issuing formal rulings concerning this feature of the new law and local collectors of internal revenue will refer to the department all inquiries they may receive in this connection.

The creation of this new board, the membership of which will be given out in a few days, is said by Secretary McAdoo to be one of the most important steps contemplated by him in the reorganization of the internal revenue service for the administration of the great task imposed by the new act. The war revenue law has the greatest productive capacity of any statute passed in the history of the country, and it is the desire and purpose of the Secretary to administer it effectually with the least possible inconvenience to the public and especially to the business of the country. Experienced observers here anticipate that the United States Supreme Court will ultimately be asked to construe certain features of the law, and supplemental legislation at the coming session of Congress is a further possibility.

W. L. C.

Higher Transcontinental Rates Asked

WASHINGTON, Oct. 30.—Applications filed by transcontinental railroads to increase rates to the Pacific coast will be subjected to hearings next month. These applications include iron and steel and other important commodities from Eastern producing points. The rate structure proposed is in strict conformity with the long and short haul clause of the interstate commerce act. Instead of reducing the rates to interior points the roads propose to increase the rates to Pacific terminals. This action is in response to the decision issued by the commission some time ago, in which it pointed out that the water competition through the Panama Canal had ceased as the result of war conditions, and therefore the roads should obey strictly the long and short haul clause, inasmuch as competitive conditions no longer exist.

Hearings will be held at room 1809, 165 Broadway, New York City, Nov. 5; at Federal Building, Chicago, Nov. 12, and at United States Court rooms, Portland, Ore., Nov. 21, in order that the commission may determine (1) whether or not the rates proposed are in compliance with the order of the commission aforesaid, and (2) to receive evidence upon the reasonableness and propriety of the increased rates proposed. The tariffs which the carriers ask permission to file are voluminous. They may be inspected at the office of the commission.

Bituminous Coal Price Advanced

Effective Oct. 29, the Fuel Administration has granted the bituminous coal producers of the United States permission to increase the price of their coal by 45c. per ton at the mine. This advance in the price set by President Wilson Aug. 21 is intended to meet exceptional conditions in certain localities, mainly higher wages to miners. The increase does not apply to any coal sold at the mine under an existing contract containing a provision for an increase in the price of coal thereunder in case of an increase in wages paid to miners. President Wilson sanctioned the increase after having received a recommendation to that effect from H. A. Garfield, Fuel Administrator.

Gentele & Co., Ltd., doing a business in trading and manufacturing and established on March 7, 1917, has taken over the business carried on by the firm of Heljestrand, Gentele & Dorenberg. Its offices are located at 22, Mjasnitskaja, Moscow, Russia.

OBITUARY

SERGT. ALBERT P. BOWE, formerly advertising manager of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, was accidentally shot and killed on the morning of Oct. 27. Sergeant Bowe was called to the colors Sept. 19 and was recently chosen from the Chillicothe cantonment to take gun practice on the rifle range at Camp Perry, Ohio. He was shot while on the line of duty through the careless handling of a gun in the hands of a lieutenant. The company says of him: "Mr. Bowe was not only capable and conscientious in his publicity work for our industry but was representative of the standards that make for good citizenship. While we must chronicle his tragic death, we are glad to be able to speak unreservedly of his sincerity, his loyalty, his concept of what constituted a man, and attest the fact that he lived in strict alignment thereto."

ISAAC GERSON, head of the firm of I. Gerson & Sons, Toledo, Ohio, died Oct. 18 following a prolonged illness from diabetes. The firm of I. Gerson & Sons was established in 1885. Elmer Gerson, son of Isaac Gerson, was admitted into partnership about 1900 and for some time conducted the scrap iron and metal business of the firm, which also operates the American Foundry Co., manufacturer of sash weights. I. Gerson & Sons are also stockholders in the Detroit Metal Refining Co., Detroit, and Mr. Gerson was a director and a member of the finance committee of the Commercial Savings & Trust Co.

AQUILA ADAMS, Sandwich, N. H., died at the Parker House, Boston, Oct. 21, at the age of 85 years. Mr. Adams was graduated from the Lawrence Scientific School and engaged in heavy machine manufacture in Boston. While in this business he built the monitor Chino, at about the end of the Civil War. He later was connected with the Adams Sugar Refinery and at the time of his retirement in 1883 was president of the Broadway National Bank, Boston.

JOSEPH REID, founder and president of the Joseph Reid Gas Engine Co., Oil City, Pa., died Oct. 23, aged 69 years. He was born in Scotland and had lived in Oil City since 1877. He developed an engine using natural gas as fuel and later organized the company that engaged in its manufacture. He was also the inventor of a line of oil burners and various other oil refiners' supplies.

SHERMAN BLAKESLEE, president Blakeslee Forging Co., Southington, Conn., died at his home in Plantsville, Oct. 23. He founded the company in 1877.

Chain Companies Will Be Consolidated

COLUMBUS, OHIO, Oct. 31 (*By Wire*).—The merger of the Columbus Chain Co. of this city and Lebanon, Pa., and the McKinnon Chain Co. of Buffalo and St. Catharines, Ont., which is now in progress, will make the Columbus-McKinnon Chain Co. the largest concern of the kind in America, and that means in the world. The McKinnon stockholders already have ratified the merger, and the stockholders of the Columbus company yesterday met to ratify the action of the board of directors. The Columbus-McKinnon Chain Co. will be an Ohio corporation with a capital stock of $2,500,000. The general offices will be in Columbus. Many improvements lately have been made in the Columbus plant, and the plant at Lebanon, Pa., has been greatly increased. It is the intention of the merged company to enlarge the St. Catharines plant so that a complete line of chains will be produced, ranging all the way from the smallest chain to the largest anchor chain. C. M. Wambaugh is president of the Columbus company and L. E. McKinnon is president of the Buffalo company. Details of the merger will be worked out within the next few days and the new company organized.

HELPED AT THE FINISH

Iron and Steel Industries Do Their Full Duty on Liberty Bond Subscriptions

In the final big drive for subscriptions for Liberty bonds the iron and steel manufacturers and metal working trades throughout the country did their full part. In Pittsburgh, Youngstown and other important industrial centers employers and employees alike subscribed for immense amounts. Some cities having a large German population, such as Cincinnati and Milwaukee, were among the very first to report that their maximum subscriptions had been attained. In the City of New York the hardware, metal and allied trades division distinguished itself by obtaining a total of $42,218,250, while the machinery and machine tools division subscribed $12,888,650. Among the subscriptions not formerly noted were the following:

Westinghouse Electric & Mfg. Co. employees	$2,233,000
Valley Mold & Iron Corporation	1,500,000
LaBelle Iron Works	2,000,000
Wheeling Mold & Foundry Co	100,000
American Bridge Co. and employees	225,000
Penn Seaboard Steel Co	250,000
Blaw-Knox Co	150,000
American Malleables Co	1,000,000
American Malleables Co. employees	90,000
Interstate Iron & Steel Co	100,000
American Woodworking Machinery Co	68,500
J. H. Williams Foundry Co	51,000
American Radiator Co	50,000
Eastern Steel Co	250,000
Eastern Steel Co. employees	81,000
Packard Motor Car Co. and employees	2,000,000
Hyatt Roller Bearing Co	300,000
Cary Mfg. Co	300,000
Victor Talking Machine Co	1,000,000
Goldschmidt Thermit Co	25,000

Pittsburgh's Millions

Subsidiary interests of the United States Steel Corporation of the Pittsburgh district subscribed for Liberty bonds as follows: National Tube Co., $2,200,000; American Sheet & Tin Plate Co., $1,730,000; American Steel & Wire Co., $1,255,000; Carnegie Steel Co., $5,500,000; H. C. Frick Coke Co., $1,500,000. Other subscriptions included: Pittsburgh Plate Glass Co., $1,000,000; Standard Steel Car Co., $1,000,000; Harbison-Walker Refractories Co., $3,000,000; Aluminum Co. of America, $3,500,000; Pittsburgh Steel Products Co., $250,000; Vanadium-Alloys Steel Co., $300,000; Allen S. Davison Co. and allied interests, $200,000; Pittsburgh Coal Co., $2,500,000; McKeesport Tin Plate Co., $3,000,000; Oliver Iron & Steel Co., $1,000,000; Oliver & Snyder Steel Co., $500,000; Firth-Sterling Steel Co., $500,000; Spang-Chalfant & Co. Inc., $1,000,000; Fayette Coal Co., $100,000; Jones & Laughlin Steel Co., $2,000,000; Westinghouse Air Brake Co., $500,000; Crucible Steel Co. of America, $1,500,000; Lockhart Iron & Steel Co., $300,000; West Penn Steel Co., $500,000, and Jamison Coal & Coke Co., $600,000.

Youngstown's Record

YOUNGSTOWN, Oct. 29.—The Youngstown steel district did nobly by the second Liberty loan, the total for the city alone being close to $11,000,000. This entrenched the municipality solidly with the 200 per cent cities of the country. The subscription of the Youngstown Sheet & Tube Co. in this recent loan drive was $2,725,000. It is also announced that the corporation has purchased a total of $10,000,000 worth of Government securities, including Liberty bonds of the first and second issues. In addition to this, employees of the company purchased about $1,000,000 worth of bonds in the second issue and in the first loan about $600,000.

In the first issue the company subscribed for $3,000,000 in bonds, but received only $875,000. In the open market the company purchased a big block. The total securities of $6,000,000 in Liberty bonds and $4,000,000 in Government notes add to the sum total.

The Trumbull Steel Co. of Warren took Liberty bonds to the total of $300,000. Employees of this company took Liberty bonds to the amount of over $100,000.

Through the Youngstown banks the Republic Iron & Steel Co. took Liberty bonds to the sum of $800,000. Employees of the company here subscribed to nearly half a million.

The Brier Hill Steel Co. took bonds to the sum of $2,000,000. Its employees subscribed to Liberty bonds to the amount of about $250,000. The Carnegie Steel Co., through the Youngstown banks and for the purpose of helping the Youngstown district, took Liberty Bonds to the amount of $400,000. Its employees took over $300,000 worth of the securities.

All of the smaller steel concerns boosted the Liberty loan and helped to swell the total for this city.

Fine Record of Hardware Men

The special Liberty loan committee of the Hardware Metals and Allied Trades Division in New York, which has been actively engaged since Oct. 18 in soliciting subscriptions, obtained the splendid total of $42,218,250. The work has been carried on by William A. Graham, chairman of the committee; Edgar Higgins, secretary; Edward H. Darville, director of publicity, and the following other members: R. H. Ismon, vice-chairman, American Can Co.; William H. Taylor, THE IRON AGE and *Hardware Age;* H. S. Demarest, Greene Tweed & Co.; George F. Taylor, Corbin Cabinet Lock Co.; John Sargent, Sargent & Co.; T. H. Taylor, American Steel & Wire Co.; G. H. Richards, Remington Typewriter Co.; Bernard Ris, U. T. Hungerford Brass & Copper Co.; William F. Forepaugh, Herring-Hall-Marvin Safe Co.; R. J. Atkinson, representative Metropolitan Hardware Association; George Chatillon, John Chatillon & Sons; R. B. Budd, U. S. Steel Products Co.; W. A. Tucker, H. A. Rogers Co.; R. G. Thompson, Lufkin Rule Co.; D. T. Mallett, *Hardware Dealers' Magazine;* A. C. Penn, A. C. Penn, Inc.; E. T. Kiggins, E. T. Kiggins.

Miscellaneous Subscriptions

Of the 1016 men on the payrolls at the Farrell, Pa., works of the American Steel & Wire Co., 1008 subscribed for Liberty loan bonds to the extent of considerably over $100,000.

The Wheeling Steel & Iron Co., Wheeling, W. Va., subscribed for $1,000,000 of Liberty loan bonds.

Among the late Cleveland subscriptions to the Liberty loan are the following: Bourne-Fuller Co., $500,000; Upson Nut Co., $250,000; B. F. Bourne, $100,000; Ohio Foundry Co., $50,000; Union Rolling Mill Co., $50,000; Empire Rolling Mill Co., $25,000; Steel Products Co., $25,000.

The Bethlehem Steel Co., Bethlehem, Pa., arranged for a subscription of $2,000,000 for the Liberty loan for purchase by employees.

Employees at the works of the New Process Gear Corporation, Syracuse, N. Y., subscribed $15,100 for Liberty bonds.

Industrial plants at Buffalo liberally supported the Liberty loan, including both companies and employees. Among the subscriptions were: The American Radiator Co., $100,000; Buffalo Machine & Foundry Co., $140,000; Buffalo General Electric Co., $250,000; Pratt & Letchworth Co., manufacturer of castings, $100,000. Employees at the following plants have subscribed for the Liberty bonds to the total noted: Atlas Steel Casting Co., $100,000; Seneca Iron & Steel Co., $49,750; Ford Motor Co., Buffalo plant, $50,000; Acme Steel & Malleable Castings Co., $50,000.

The American Brass Co., Waterbury, Conn., subscribed $500,000 to the second Liberty loan. The company subscribed $1,500,000 to the first loan.

The New Departure Manufacturing Co., Bristol, Conn., subscribed $200,000 to the second Liberty loan.

In addition to subscribing for $2,500,000 of Liberty bonds, the Jones & Laughlin Steel Co., Pittsburgh, has agreed to duplicate dollar for dollar every subscription for Liberty bonds made its employees, in all parts of the country. This includes the blast furnaces, steel mills, ore mines and transportation systems owned by the company in Pittsburgh, and in the ore fields. It includes not only furnace and mill employees, but also office employees in Pittsburgh, and all other places where it has business interests. This company was among the first of the industrial concerns to adopt this plan.

Machinery Markets and News of the Works

TOOLS FOR EXPORT TAKEN

War Industries Board Seizes Machines in Storage

Between 500 and 600 Commandeered for Use in This Country—Buying of Machine Tools and Cranes by Shipbuilders Feature of Past Week

Under the authority of the War Industries Board a representative of a New York machine-tool company made a canvass of export warehouses last week and listed between 500 and 600 tools, boxed and ready for shipment to foreign countries, which had not left this country because of difficulty in obtaining shipping space. In view of the urgent needs of such tools by American manufacturers it was decided by the Machine Tool Section of the War Industries Board that they should be commandeered, which has been done. It is understood that the machine-tool builders will assist the exporters in obtaining duplicate machines when it appears certain that they will be able to ship them abroad. The Government will not, however, under present circumstances, permit tools needed for the war industries to leave this country except for equally urgent war needs of the Allies. Moreover, it is now practically necessary for machinery makers to show priority certificates in shipping machines from their plants, as in many instances under the present embargo conditions the railroads will accept only those shipments which are shown to be needed by companies engaged on war contracts.

Production of machine tools is to be accelerated by the War Industries Board by the granting of contracts to companies which have the equipment to build them even though they have not had previous experience in machine-tool manufacture. The Hall Printing Press Co., Dunellen, N. J., for example, has been given a contract for boring lathes.

Shipbuilders are large buyers in Eastern markets, the New York, Philadelphia and Boston trade feeling the effect of the demand for equipping torpedo boat destroyer plants of the Fore River Shipbuilding Corporation and the New York Shipbuilding Corporation. The merchant shipbuilding yards are also continuing to buy. The Submarine Boat Corporation has just placed a $150,000 order for locomotive cranes.

For munitions work there is an inquiry by the International Bureau of Supplies, 135 Broadway, New York, for 300 screw machines on behalf of a client whose name is being withheld. The Standard Ordnance Corporation, 115 Broadway, New York, is seeking equipment for an Ohio plant. The Tioga plant of the Taylor-Wharton Iron & Steel Co., Philadelphia, has received a shell contract and is inquiring for equipment. The Milton Mfg. Co., Milton, Pa., will engage in ammunition-making.

The Chicago market is receiving a large demand for tools for shell work. The Holt Mfg. Co., Peoria, Ill., which has a shell contract, will require about $100,000 worth of equipment. The Stenotype Co., Indianapolis, Ind., has an inquiry out for machines needed in munitions work. The Edward Valve Mfg. Co. is making 3-in. shells.

In the Cleveland market the Standard Parts Co., Cleveland, continues to buy. The Cromwell Steel Co., Lorain, Ohio, has issued a small list. A Detroit automobile company wishes to buy 46 lathes.

New York

NEW YORK, Oct. 30.

Shipbuilders have been large buyers of machine tools and cranes during the past week. The largest orders have been placed by the Fore River Shipbuilding Corporation for its new destroyer shops. The Cleveland Crane & Engineering Co., Cleveland, received an order for 27 cranes, 20 of small capacity, and other orders are to be placed probably this week, making a total of between 70 and 80 cranes. The orders are being placed by the Aberthaw Construction Co. Large orders for machine tools have been received during the week in New York.

The Submarine Boat Corporation is buying steadily for its new merchant ship plant at Newark, N. J. A large order has been placed for locomotive cranes. An inquiry has been sent out for radial drills. The Federal Shipbuilding Co., New York, has issued a list of ten shop cranes described as follows: Four 10-ton, 65 ft. span, 25 ft. lift, double trolley, for the plate and angle shop; four 20-ton, 45 ft. span, 34 ft. lift, single trolley, and two 35-ton, 28 ft. span, 58 ft. lift, for the boiler shop. The Groton Iron Works, New London, Conn., has closed with the Erie Steel Construction Co., Erie, Pa., for three small shop cranes. It is in the market for radial drills and other machine tools. It is reported that the Union Iron Works, San Francisco, is placing large orders, though none of these, so far as reported, has come to New York offices. The Newburgh Shipyards, Inc., which is to build ships for the Emergency Fleet Corporation at Newburgh, N. Y., is again in the market for machines.

The International Bureau of Supplies, 135 Broadway, is in the market for 300 screw machines for a munitions manufacturer. It is also seeking machinery and supplies for export to India. The Standard Ordnance Corporation, 115 Broadway, is reported to be trying to place orders for a plant in Ohio.

Considerable interest was excited in the machine-tool trade during the past few days by reports that the Simplex Automobile Co., New Brunswick, N. J., is preparing lists of machine tools to be bought and that it will positively do considerable buying. There has been such a delay in the placing of business by this company and the General Vehicle Co., Long Island City, N. Y., for the tools needed to manufacture airplane engines that it was feared some hitch had occurred in the granting of Government contracts.

The Hall Printing Press Co., Dunellen, N. J., is buying equipment for work on two war contracts, one for boring lathes, and the other for printing presses, which are to be mounted on motor trucks for use on the battlefields of France.

The General Electric Co., Schenectady, N. Y., has bought a 50-ton traveling crane.

A good inquiry for machine tools for export to Italy, Japan, India and other countries is reported. The J. G. White Engineering Corporation has bought a number of cylinder grinders for export to an airplane engine plant in Italy.

The Bureau of Yards and Docks, Washington, D. C., will receive bids until Nov. 19 for fitting out cranes and other work at the Brooklyn, N. Y., Navy Yard, to cost about $850,000. It is also planning for the construction of a new 50-ton crane to cost $150,000.

The Reliance Grant Elevator Equipment Corporation, New

York, has been incorporated with a capital of $50,000 to manufacture elevator equipment. R. C. Bennett, J. L. Lockwood and G. C. Pillotson, 2 Rector Street, are the incorporators.

The Blancke Twist Drill & Tool Co., New York, has been incorporated with a capital of $500,000 to manufacture twist drills, tools, etc. L. C. Blancke, C. Ter Meer and A. J. Talley, 6 Mount Morris Park West, are the incorporators.

Rubel Brothers, Inc., Glenmore Avenue, Brooklyn, N. Y., are having plans prepared for a new one and two-story ice manufacturing plant, about 100 x 200 ft., to be erected on Blake Avenue at a cost of $75,000.

The Taylor Motor Truck Co. of New York, New York, has been incorporated with a capital of $10,000 to manufacture motor trucks. C. K. Christy, W. J. Heffernan and E. F. Twyman, Jr., Fifty-fifth Street and Broadway, are the incorporators.

The Gas Engine & Power Co. and Charles L. Seabury & Co., Morris Heights, New York, manufacturers of gas and gasoline engines, etc., have had plans prepared for the construction of three shipways for boat construction at 177th Street and the Harlem River.

The H. B. Shontz Co., New York, has been incorporated with a capital of $50,000 to manufacture engines, motors, etc. H. B. Shontz, J. A. Smith and P. J. Durham, 244 West Forty-ninth Street, are the incorporators.

The Frederick A. Koch Mfg. Corporation, East Thirty-fifth Street, Brooklyn, N. Y., manufacturer of surgical instruments, will make alterations and improvements in its plant to cost about $15,000.

The Triangle Sheet Metal Works, New York, has been incorporated with a capital of $5,000. J. Streimer and H. Lieberthal, 601 West 172d Street, are the incorporators.

The Willard F. Meers Machine Co., New York, has increased its capital from $100,000 to $150,000.

The Gasoline Engine Equipment Co., 390 Webster Avenue, Astoria, L. I., manufacturer of gasoline engines, etc., is planning for the construction of a one-story addition, about 30 x 35 ft.

The Spadone Machine Co., New York, has been incorporated with a capital of $20,000 to manufacture machinery. A. A., W. A., and H. Spadone, 126 Duane Street, are the incorporators.

The Master Steam Boiler Equipment Co., New York, has been incorporated with a capital of $50,000 to manufacture boiler apparatus. W. J. Bauer, T. B. Hustwick and A. W. Palmer, 27 Cedar Street, are the incorporators.

The National Toggle Co., New York, has been incorporated in Delaware with a capital of $1,000,000 to manufacture machines for assembling toggles, etc. Maurice Rubinger, Theodore F. von Dorn and Edwin S. Merrill, New York, are the incorporators.

The Pelican Motor Ship Co., New York, has been incorporated with a capital of $350,000 to operate a shipbuilding works. M., P. H., and C. Zornow, 1270 Broadway, are the incorporators.

The Chris Spence Co., New York, has been incorporated with a capital of $10,000 to operate a shipbuilding works. Chris Spence, W. S. Dorethy and C. W. Jesler, 257 West Street, are the incorporators.

The Empire Electric Steel Corporation, New York, has been incorporated by E. H. Rapp and G. R. Hamilton, 2 Rector Street, with a capital of $500,000.

The Auburn Vulcanizing & Storage Battery Co., Auburn, N. Y., has been organized to operate a plant at 18 Clark Street. John W. McKinley heads the company.

The Henry Cheeny Hammer Co., Little Falls, N. Y., manufacturer of hammers, has been incorporated with a capital of $100,000. K. E. Morgan, J. V. Hemstreet and D. J. Williams, are the incorporators.

The Oxford Foundry & Machine Co., Oxford, N. J., has been incorporated with a capital of $50,000 to manufacture iron and steel products. William A. Bartley, Oxford; Bernard Brady, Lake Hopatcong, and Howard L. Coas, West Orange, are the incorporators.

The Picatinny Arsenal of the United States Government, Dover, N. J., has secured an appropriation of $40,000 for the construction of a new assembling plant and igniter building. Plans are now being prepared.

The Riverside Iron & Steel Co., Riverside, Paterson, N. J., has been incorporated with a capital of $10,000 to manufacture iron and steel products. Samuel Seager and Abraham Beaver, Paterson, are the incorporators.

The Barge & Lighter Repair Co., Jersey City, N. J., has been incorporated with a capital of $100,000 to operate a local boat works. John H. Patterson, William N. Sewell and Charles J. Gormley, Jersey City, are the incorporators.

The Davis-Bournonville Co., Van Wagnen Avenue, Jersey City, N. J., manufacturer of oxy-acetylene welding and cutting equipment, will build a four-story, brick and concrete addition about 59 x 100 ft.

The Everlasting Valve Co., West Side Avenue, Jersey City, N. J., will build an addition to its machine shop to cost about $15,200.

The Kaufman Potato Cutting Machine Co., Paterson, N. J., has been incorporated with a capital of $10,000 to manufacture vegetable-cutting machines and other machinery. Alexander and Wolff Kaufman, 155 Hamburg Avenue, are the incorporators.

The Essex Foundry, Murray Street, Newark, N. J., specializing in the manufacture of cast-iron pipe, is taking bids for the construction of a one-story addition, about 70 x 115 ft.

The United States Piston Ring Co., Newark, has been incorporated with a capital of $100,000 to manufacture piston rings. Emanuel P. Scheck, Newark; Lewis Fisher, Jersey City; and E. I. Quinn, Arlington, are the incorporators.

The Gill Piston Ring Co. of New Jersey, 293 Halsey Street, Newark, has been organized to manufacture piston rings. Harry Rubin, 101 East 140th Street, New York, heads the company.

The Lackawanna Bridge Co., 2 Rector Street, New York, has filed plans for the construction of two one-story, brick and steel factory buildings, 60 x 630 ft., to cost $252,000; and two one-story, brick and steel buildings, 60 x 60 ft., to cost $28,000, at Port Newark Terminal, Newark.

The Newark Machine & Engineering Co., Newark, has been incorporated with a capital of $100,000. Emanuel P. Sheck, Newark, is the principal incorporator.

The Johnson Products Co., Newark, has been organized to manufacture aluminum goods. Charles Johnson, 529 South Tenth Street, heads the company.

The Alberger Pump & Condenser Co., 140 Cedar Street, New York, whose plant is at Newburgh, N. Y., has purchased 18 acres of land on which it will erect a new foundry much larger than the existing one and which will enable it to produce all of its own castings. Eventually a complete new plant will be built.

Plans have been completed to convert the American Car & Foundry Co.'s works at Depew, N. Y., to turn out 6-in. shells for the Government. From 3000 to 4000 men will be employed, and it is expected that operations will begin about Jan. 1.

Plans have been drawn for a one-story power-house, 40 x 80 ft., to be erected by the city of Rochester at Irondequoit. E. H. Pierce, City Hall, Rochester, is commissioner of Public Works Department.

The Fulton Steel Corporation, Woolworth Building, New York, is having plans drawn for a steel castings plant at Fulton, N. Y., to cost approximately $60,000. Howard W. McAlteer is president.

The Jamestown Iron & Metal Co., Jamestown, N. Y., has been incorporated with a capital stock of $10,000 by A., M. M. and A. L. Meeker.

The Stewart Motor Corporation, Buffalo, has had plans drawn for an addition, 60 x 100 ft., to its plant at East Delavan Avenue and the New York Central Railroad Belt Line.

New England

BOSTON, Oct. 29.

No large lists originating in New England have been reported by machine tool builders and distributors. The munitions plants and the Fore River works are steadily placing orders for large equipment and buying such machine tools as can be picked up in New England factories. Deliveries on all large sizes are being pushed so far into the future that some method of obtaining larger output seems essential if Government plants are to be equipped for production as soon as the buildings are ready.

Phenomenal prices are being paid for second-hand machinery that is available for immediate use on Government work. A typical instance is that of a large boring mill, bought 15 years ago for $6,500 and which has been in constant use since, which was sold on the floor of the plant for $27,000, the purchaser to take it away. It is expected that the question of prices for machine tools will be one of the chief topics discussed at the committee meetings at the National Machine Tool Builders' convention at New York this week. It is probable that the increasing wages and taxes will more than offset the possible saving in cost of materials, with the result that prices will move upward on most tools.

The plant of the Hopkins & Allen Arms Co., Norwich, Conn., has been sold to the Belgian Government and will be

turned over to the Marlin-Rockwell Corporation, New Haven, Conn., which will assume the outstanding obligations amounting to nearly $4,000,000. The latter company will complete the Belgian rifle contract and will then make Browning guns for the United States Government. It is understood that a large addition is to be added to the plant and that the number of employees will be increased to about 2500.

The Boston Belting Corporation, Boston, has been incorporated with authorized capital stock of $1,000,000 to take over the plant and business of the Boston Belting Co. William F. Lawton, Quincy, is president and Herman A. Dolbeare, Weston, treasurer.

The Adams-Holland Electric Co., Revere, Mass., electrical machinery, has been incorporated with capital stock of $25,000. James Buchanan, Chelsea, is president and Alfred T. Timayenis, Revere, treasurer.

The New Haven Screw Co., New Haven, Conn., has increased its capital stock from $100,000 to $150,000.

The Gorham Co., Providence, R. I., has awarded a contract for a loading plant for munitions at East Providence, R. I., comprising several frame structures.

The Eastern Machine Screw Co., New Haven, Conn., has awarded a contract for an addition, 30 x 105 ft., one story.

The Victoria Iron Works, machinery, Northampton, Mass., has been incorporated with authorized capital stock of $10,000. D. Edward Hennessy is president and Richard H. Dickson, treasurer.

The Perry-Buxton-Doane Co., Boston, is building a one story factory, 42 x 144 ft., in South Boston.

The Hoosac Lumber Co., Boston, ship construction and timber, has been incorporated with authorized capital stock of $600,000. Huntington P. Faxon, Cambridge, is president and Philip Atwater, Dorchester, treasurer.

The Beaman & Smith Co., machine tools, Providence, R. I., has awarded a contract for an addition, 15 x 60 ft., one story.

The Bethlehem Shipbuilding Corporation, Fore River works, has begun the erection of a one story boiler plant, 140 x 550 ft., with two ells, at Fields Point, Providence, R. I.

The United States Auto Gear-Shift Co., Portland, Me., has been incorporated with authorized capital stock of $1,500,000. Clarence G. Trott is president and P. B. Drew, treasurer.

The Fairmount Foundry Co., Woonsocket, R. I., has awarded a contract for a foundry, 70 x 85 ft., one story.

The William J. Nangle Machine Co., Lynn, Mass., machinery, has been incorporated with authorized capital stock of $5,000. William J. Nangle, Danvers, is president and Herbert W. Simmons, Lynn, treasurer.

The Geometric Tool Co., New Haven, Conn., is building an addition to its office, 18 x 52 ft., two stories, and a garage, 68 x 116 ft., one story.

The Biddeford Shipbuilding Co., Portland, Me., has been incorporated with authorized capital stock of $100,000 by Ernest L. Morrill, Saco; George C. Fogg, Biddeford; George C. Agnew, New York, and others.

Morris C. Rosenbaum and others have taken over the plant of the John Davenport Co., Stamford, Conn., and several additions are contemplated. Bridgeport and Newark companies will be consolidated with the new organization in the manufacture of gasoline engines and electric truck equipment.

Landers, Frary & Clark, New Britain, Conn., will add another story to a building, 50 x 317 ft., and will build a one-story storehouse, 36 x 120 ft.

The Trumbull Electric Co., Plainville, Conn., manufacturer of electrical supplies, is building a three-story and basement addition, 50 x 100 ft., to cost about $50,000.

The Standard Electric Time Co., Logan Street, Springfield, Mass., manufacturer of electric clocks, has commenced the erection of a three-story addition to cost about $25,000.

The Heald Machine Co., 10 New Bond Street, Worcester, Mass., manufacturer of grinding machines, etc., will build a one-story addition to its machine shops, about 80 x 200 ft.

Philadelphia

PHILADELPHIA, Oct. 30.

The New York Shipbuilding Corporation, Camden, N. J., is the biggest buyer at present in this market, its requirements for extensions for torpedo boat destroyer construction running into large figures. In most instances, sellers of machine tools, cranes, etc., have been invited to visit the offices at Camden, inspect the lists and select what they can furnish. An inquiry has been sent out for four locomotive cranes. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is making inquiries for new equipment. It is reported here that the Newport News Dry Dock & Shipbuilding Co., Newport News, Va., will buy about $1,000,000 worth of new equipment. All three of the new destroyer plants will build galvanizing shops, for which cranes or hoists and other equipment will be needed. The Philadelphia and Norfolk navy yards have placed orders aggregating $45,000 for hoists for new shops. The American International Shipbuilding Corporation has made inquiry for a few machine tools and reports that it will shortly buy a considerable number. Bolt machines and tapering rolls are among its requirements. A number of radial drills will probably about be bought.

The Tioga plant of the Taylor-Wharton Iron & Steel Co., Philadelphia, has received a shell contract and is inquiring for the necessary equipment. This plant is also being equipped for making gun forgings for the United States Navy. The Bartlett & Hayward Co., Baltimore, at work on munitions contracts, continues to buy. The Milton Mfg. Co., Milton, Pa., will engage in ammunition work and may require additional machine-tool equipment.

The Badenhausen Co., Philadelphia, is making additions to its shops at Bound Brook, N. J., and Norristown and Bridgeport, Pa., and is building a new shop at Cornwells, Pa., all of which will be engaged for the next 15 months in the manufacture of boilers for the Emergency Fleet Corporation. A considerable number of machine tools have been bought. An order for four traveling cranes for the new Cornwells shops has been awarded to Maris Bros., Philadelphia. The Shutte & Koerting Co., Philadelphia, is making a few purchases for its shops at Cornwells, Pa., which are engaged in making parts for battleships.

An inquiry for several hundred small tools for shipment to British munitions plants is reported here. A large number of twist drills is wanted.

The C. H. Wheeler Mfg. Co., Eighteenth and Lehigh avenues, Philadelphia, manufacturer of pumps, is contemplating the construction of a two-story addition to its machine shop.

The Keystone Needle Works Co., Philadelphia, has been incorporated with a capital of $30,000. Angelo Gambino, 1228 South Eighth Street, is the principal incorporator.

The S. A. Ashman & Son Co., East Tioga Street, Philadelphia, manufacturer of iron and steel forgings, will build an addition to its forge shop, about 19 x 44 ft.

Lindsay Hyde & Co., 2130 East York Street, Philadelphia, manufacturers of machinery and parts, will build a one-story, brick addition to their machine shop.

Paul Snyder, Philadelphia, has filed plans for the erection of a new machine shop at 176 East Tulpehocken Street.

The Link Belt Co., Nicetown, Philadelphia, manufacturer of elevating and conveying machinery, etc., will make alterations and improvements in its plant to cost about $20,000.

The Bureau of Yards and Docks, Washington, D. C., has had plans prepared for the installation of new mechanical equipment at the Government marine works, Philadelphia, to cost about $99,000.

The Union Machine Works & Iron Foundry, Philadelphia, manufacturer of iron and steel castings, etc., will make improvements in its foundry on South Water Street to cost about $5,500.

The Scranton Foundry & Engine Works, Scranton, Pa., has commenced the erection of a new two-story machine shop, about 50 x 60 ft.

The Seamless Tube Machinery Co., Sewickley, Pa., has been incorporated with a capital of $10,000 to manufacture machinery. Edward Hoopes, 33 Thorn Street, is the principal incorporator.

The Carpenter Steel Co., Exeter Street, Reading, Pa., is having plans prepared for a one-story addition, about 50 x 110 ft.

The William F. Remppis Co., 226-236 Spruce Street, Reading, Pa., manufacturer of iron and steel shapes, ornamental iron products, etc., has been reorganized with increased capital to provide for expansion. William F. Remppis, Lambert R. Behr and Ferdinand Thun head the company.

The Reading Chain Block Co., Reading, Pa., manufacturer of chain blocks, and iron and steel castings, is building an addition to its plant to cost about $25,000. F. H. Howard is president.

The National Stamping Co., Crafton, Pa., has been incorporated with a capital of $5,000 to operate a local plant. John A. McGhee is treasurer.

The Lee Tire Corporation, Norristown, Pa., manufacturer of automobile tires, is removing its office to New York. The former office space at the Spring Mill plant will be utilized for manufacturing.

The Butler Steel Co., Hazleton, Pa., has completed the erection of a new foundry which will be placed in immediate operation.

The Paquet Window Glass Machine Co., Jeannette, Pa., has been incorporated with a capital of $10,000 to manufacture glass machines. Robert Hordis, Jeannette, is treasurer.

Veale Brothers, Hazleton, Pa., have acquired the machine shop of Frank Mumaw, which they will enlarge for increased capacity.

The United States Rubber Co., Williamsport, Pa., is planning for the erection of a five-story addition for increased capacity. A new power plant will also be built.

The Berks Foundry & Machine Co., Reading, Pa., has acquired the plant of the Watsontown Foundry Co., Watsontown, which it has been operating under lease.

Baltimore

BALTIMORE, Oct. 29.

The National Equipment Co., Wilmington, Del., has been incorporated with a capital of $100,000 to manufacture ventilators, etc. William F. Smalley and John P. Cann, Wilmington, are the incorporators.

The Porcelain Enamel & Mfg. Co., O'Donnell Street, Baltimore, is taking bids for the erection of a one-story building, about 120 x 220 ft., at Bayard and Ridgeley Streets, to cost about $100,000.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, is taking bids for the construction of six one-story, brick and concrete shop buildings. Day & Zimmerman, Philadelphia, are the architects.

The Chesapeake Iron Works, Westport, Md., is taking bids for the erection of a reinforced-concrete machine shop, about 50 x 250 ft.

Chicago

CHICAGO, Oct. 29.

What is described by machine-tool men as the first real wave of demand for shell-making equipment is making itself felt in this section, and it is predicted that as soon as a sufficient number of shops are engaged in the manufacture of guns, mounts and 6 and 9-in. shells, there will be an avalanche of demand for the smaller sizes of machines which are a requisite in the manufacture of shells under 6 in. Of course, there has been buying of shell-making equipment here, but most of it called for fairly large tools and has been restricted to a few companies. In the past few days at least two agencies of the Government have asked light on the number of plants in or near Chicago which are equipped to make certain sizes of shells. Investigation has shown that their number is not great. An East Moline company already is delivering guns to the Government.

The Hart-Parr Co., Charles City, Iowa, previously reported in the market for large lathes for shell work, to replace tools destroyed by fire, has not yet placed its orders.

The Holt Mfg. Co., Peoria, Ill., which has Government contracts for tractors running into the millions, has also taken an order for shells, and will require about $100,000 worth of equipment.

The Stenotype Co., Indianapolis, has inquiries out in this market for machines required for munitions work. This is one of the companies that handled similar foreign orders and is in a good position to serve the home Government.

The Ajax Forge Co., Chicago, is working on hubs for artillery wagons.

The Edward Valve Mfg. Co. is making 3-in. shells.

The demand for heavy machines such as planers, horizontal and vertical boring mills, lathes, etc., is still a leading feature, one dealer stating that he could readily dispose of at least 20 large horizontal boring mills to buyers who would be glad to pay premiums to insure quick delivery. The inquiries come from the Atlantic seaboard on the East and Denver on the West; in fact, some inquiries have come from the Pacific coast shipyards. Among the industries anxious to get tools are makers of shoe machinery.

The G. M. Davis Regular Co., manufacturer of valves, has purchased a site, 120 x 300 ft., at Twenty-fifth Street and Washtenaw Avenue, Chicago, on which it will erect a one-story building to cost about $75,000. Frank D. Chase, industrial engineer, Chicago, is preparing the plans.

A permit has been issued for a one-story brick factory, 163 x 234 ft., at 2662-2664 Southport Avenue, Chicago, to cost $60,000, for the A. Nelson Mfg. Co., 564 West Randolph Street, maker of automobile accessories.

The Chicago Universal Cement Mold Co., Chicago, has been incorporated with a capital stock of $50,000 by Jacob Mullen Thompson, Henry Van Houten and Johanna S. Becker.

The Liberty Foundries Co., East Rockford, Ill., has increased its capital stock from $5,000 to $25,000.

The Wagner Castings Co., Decatur, Ill., has been incorporated with a capital stock of $40,000 by Albert W. Wagner, Thomas W. Samuels and Charles W. Leforgee.

Work on the new plant of the Peoria Malleable Iron Co. is being rushed and it is expected that it will be ready for operations Jan. 1. It will give employment to 400 men, including about 200 molders.

Ground has been broken for the factory which the U. S. Smelting Furnace Co. will build at Belleville, Ill. The company has many orders in hand, and before its machinery is entirely installed will begin to assemble furnaces, the parts of which will be made in Belleville foundries. The officers are: President, Arthur Jones; vice-president, George B. McRogers; treasurer, John Marsh, and secretary, Walton Marsh. The officers also compose the directorate.

Negotiations are under way looking to the removal of the Graham Supply Co.'s plant from Chicago to Grand Rapids, Mich. It manufactures electric heat-control devices and other specialties. Several Grand Rapids men are interested in the company, which has a branch office in the Powers Building, that city.

The General Electric Co., Cleveland, will erect a one-story power house, 42.8 ft. sq., to cost $10,000, at 2240 Flournoy Street, Chicago, in connection with the new plant it is building.

The J. C. Born Machine & Foundry Co., Belleville, Ill., has been incorporated with a capital stock of $10,000 by John C. Born, W. F. Born and E. W. Twenhoefel.

The Rotary Compressor Co., Belleville, Ill., has been incorporated with a capital stock of $2,000 by Anthony J. Stockel, L. N. Perrin and T. E. Kircher.

The American Steel & Wire Co., Chicago, has purchased warehouses and leasehold interests at Twenty-first and Morgan streets, Chicago, part of which it has occupied for some years.

The Kenwood Bridge Co., Chicago, preliminary to the enlargement of its works, has acquired a tract of land in Seventy-ninth Street, adjacent to Kenwood and Dorchester avenues.

The Sioux City Welding & Machine Works, Sioux City, Iowa, is soon to start the construction of a one-story welding and machine shop to cost $30,000. The contract has been awarded and the shop is to be finished in the spring. It will be used for the manufacture and repair of automobile parts. The present plant will be used for storage purposes.

Milwaukee

MILWAUKEE, Oct. 29.

The demand for machine tools shows no abatement, and if anything is even more extensive than it has been in recent months for both Government and private requirements. So many milling machines are desired that if the capacity of local builders were twice as great, it would hardly be possible to turn them out in time to meet delivery specifications. Tool builders have been relieved of much worry and trouble by the establishment of an organization to direct distribution according to the most urgent needs.

Shopowners are making every effort to avoid new construction work until conditions become more favorable, but for such production as field and naval guns, which is a new field of endeavor in this section, it has been necessary to erect new groups, and three projects of this kind are in course of establishment.

The Four Lakes Ordnance Co., Madison, Wis., has been organized by George A. Steinle and other officials of the Steinle Turret Machine Co., Madison, to manufacture naval ordnance for the Government. It is the second ordnance company to become established in Madison, and the third in Wisconsin. As previously noted, the Northwestern Ordnance Co., Madison, organized by the Gisholt machine-tool interests, will manufacture 4.7-in. field pieces, and the Wisconsin Gun Co., Milwaukee, will build 3-in. guns of the 1916 model. Each of the three corporations is nominally capitalized at $100,000, but the actual investment in each instance will approximate $1,000,000, it is believed. The Four Lakes Ordnance Co. will erect a complete manufacturing plant, further details of which will be made public as they mature.

The Standard Steel Corporation, Milwaukee, incorporated with a capital stock of $60,000, has increased its capital to $300,000 and announces that it will break ground early in 1918, for its new manufacturing plant at Lake Street and

Hopkins Road, North Milwaukee, the initial investment to be about $200,000. Steel barn and dairy equipment, concrete mixers and sanitary devices for farms will be manufactured. Tentative plans call for a foundry, machine-shop and assembling room, about 100 x 250 ft. The main offices are at 1002 Majestic Building, Milwaukee. E. J. DeGuenther is president and treasurer.

The Cruiser Motor Car Co., Madison, Wis., will award contracts this week for the erection of the first unit of its new plant, 60 x 250 ft., of brick, steel and concrete, part two-story and basement and the remainder one-story, with sawtooth roof. The second floor will be used for offices and drafting rooms. A convertible touring-camping car adapted for army field service will be manufactured. It is said that motor, transmission and axle units will be purchased. The new plant is to be ready Jan. 1.

The Keller Pneumatic Tool Co., Fond du Lac, Wis., has completed the transfer of its entire works and headquarters to Grand Haven, Mich., where local capital has provided a new plant of increased capacity. The company has been reincorporated under the laws of Michigan. The space vacated at Fond du Lac has been leased by the Rex Typewriter Co., which will buy additional equipment from time to time.

The LaCrosse Tractor Co., LaCrosse, Wis., has authorized the purchase of new machinery and equipment amounting to $75,000, in order to increase its facilities about 75 per cent. An addition to its north side plant is contemplated for early next year. B. F. Hamey is general manager.

The International Harvester Co., 784 Park Street, Milwaukee, is taking bids for the erection of an ell-shaped forge shop, 75 x 147 ft., and 27 x 327 ft., and a new cream separator building, 72 x 80 ft. Paul F. Schryer is superintendent.

The board of education, West Allis, Wis., will soon call for bids for the erection of a $150,000 high school building, including manual training and domestic science departments.

Frank Holton & Co., Chicago, manufacturers of band and other musical instruments, will build a gas producer plant in connection with its new factory now being completed at Elkhorn, Wis.

The Charles Skidd Mfg. Co., Janesville, Wis., manufacturer of pasteurizing and other dairy machinery, will build a two-story addition, 45 x 75 ft.

The Rassman Mfg. Co., Beaver Dam, Wis., maker of steel barn equipment and other farm machinery, has purchased the foundry and machine-shop group of the former J. S. Rowell Mfg. Co., and will take possession Nov. 1. The acquisition gives the company complete casting shop facilities and enables it to more than treble its output.

Cleveland

CLEVELAND, Oct. 29.

The demand for machinery from companies having Government orders continues fairly heavy, a large part of which is for motor truck work. A Detroit automobile company which inquired some time ago for 60 or more machines, but which did not make purchases, now announces that it wishes to buy the 46 lathes on the list. The demand for turret lathes and screw machines is very good. While there is no round lot buying, makers are receiving numerous orders for single machines. The effect of priority orders is being felt by manufacturers not engaged on Government work, who are being disappointed on deliveries of machines ordered some time ago.

The Standard Parts Co., Cleveland, is in the market for the following equipment for Government motor truck work in its American Ball Bearing plant, Cleveland: One end drilling machine, one 26-in. lathe, one heavy duty drilling machine, one multiple spindle drilling machine with 20-in. spindle, two horizontal drilling machines, one radial drilling machine, two No. 3 horizontal plain milling machines.

The Cromwell Steel Co., Lorain, Ohio, has issued the following list of machinery requirements for its repair shop: One 20-in. shaper, one 25-in. upright drilling machine, one 2½-in. bolt cutter, two high-speed hack saws, two wet-tool grinders, one No. 3 universal milling machine, one 62-in. vertical boring mill.

The Griscom-Russell Co., Massillon, Ohio, has purchased the old plant of the Massillon Foundry & Machine Co. and will move its present boiler shop to the new quarters. It will also build an addition, 60 x 80 ft., to its warehouse. The Massillon Foundry & Machine Co. is moving into its new plant.

The Reliance Mfg. Co., Massillon, has commenced the erection of a new factory, 200 x 300 ft., which will be used for the manufacture of cold drawn steel used by the company. The contract has been awarded to the Austin Co., Cleveland.

To provide additional capital necessitated by its increased business the Morgan Engineering Co., Alliance, Ohio, will add $573,000 to its preferred stock. The company states it has about $10,000,000 worth of work on its books, including an order from the Government for gun carriages for 5 and 6-in. guns amounting to between $3,000,000 and $4,000,000.

The plant of the Seneca Chain Co., Kent, Ohio, has been sold to the Kent Chain Co., recently incorporated with a capital stock of $400,000. It is stated that operations will begin in about 60 days.

The Bunting Bronze & Brass Co., Toledo, Ohio, has taken over the plant of the Standard Die & Tool Co. in that city.

The Lewis Electric Welding & Mfg. Co., Toledo, with a capital stock of $100,000, has taken over the business of the Lewis Foundry Co., and will make some extensions to the plant. It will specialize on semi-steel cast head valves for gas, gasoline and oil engines.

The Broadway Foundry Co., Cleveland, will erect a new foundry, 66 x 116 ft.

The United States Malleable Iron Co., Toledo, has increased its capital stock from $250,000 to $300,000.

The Central Machine & Tool Co., Toledo, has increased its capital stock from $50,000 to $100,000.

The City Brass Foundry Co., Cleveland, has taken bids for the erection of a one-story addition, 40 x 60 ft., on St. Clair Avenue.

The Canton Rim Co., Canton, Ohio, is taking bids for a one-story addition, 60 x 240 ft., to cost about $15,000. William T. Beardsley is president.

Detroit

DETROIT, Oct. 29.

Continued demand by makers of munitions for machine tools has kept the market active the past week. Labor is in good demand with skilled machinists receiving high wages. The shipbuilding yards in Detroit are working to capacity. Plans for the incorporation of the $3,000,000 company to manufacture munitions in Detroit are progressing, and the business men behind the organization expect to build or secure a mammoth factory as soon as organization details are settled.

The Manistee Shipbuilding Co., Manistee, Mich., has invested $60,000 in new machinery to repair old boats. About 300 more men will be employed.

The Novo Engine Co., Lansing, Mich., has announced a building program, including the erection of a new foundry and machine shop.

The Russel Motor Axle Co., Detroit, has changed its capitalization from $500,000 common stock and $100,000 preferred to $750,000 common stock only. It has just completed a new addition and purchased $50,000 worth of machinery which will increase its output 60 per cent.

The Columbia Motor Truck Co., Pontiac, Mich., has received a large foreign order for two-ton Columbia trucks. A new assembling plant is being rushed to completion. A. F. Clark and Leigh Lynch are in charge.

The Enterprise Iron & Metal Co., Grand Rapids, Mich., has taken bids for the erection of a new plant.

Indianapolis

INDIANAPOLIS, Oct. 29.

The Hoosier Gas & Power Co., Indianapolis, has been incorporated with $100,000 capital stock to generate electricity. The directors are Francis J. Catternin, Wilkins W. Wiswell and Justice D. Detwiler.

Swift & Co., Chicago, will construct a fertilizer plant at Hammond, Ind., at an estimated cost of $500,000.

The Laurel Motors Co., Anderson, Ind., a new organization, which will establish a plant, has taken offices in the Union Block.

The Shotwell Pump & Tank Co., Indianapolis, has increased its capital stock from $60,000 to $100,000.

The Eagle Machine Co., Indianapolis, has been incorporated with $15,000 capital stock to manufacture tools, fixtures and gages. The directors are Horace J., Charles W. and J. Edward Yount.

The New Process File Co., Newcastle, Ind., has been incorporated, with $10,000 capital stock, to manufacture files. The directors are W. S. Crum, A. A. Brown and John W. Rodgers.

The Polhamus Co., Fort Wayne, Ind., has been incorporater with $100,000 capital stock to manufacture oil generators, automobile accessories and tools. The directors are Albert Z., Russell H. and M. J. Polhamus.

The Indiana Portland Cement Co., recently organized at Huntington, Ind., with $1,000,000 capital stock, has bought 500 acres of land near the city and will build a plant which will give employment to about 150 men. Adam L. Beck, Huntington, is president; Marshal Beck, treasurer, and William H. Hart, secretary. W. S. Creveling will be superintendent.

The Stutz Motor Car Co., North Capitol Avenue, Indianapolis, is building a new one-story machine shop, 98 x 180 ft., to cost about $38,000.

The American Steel & Foundry Co., Hammond, Ind., is building a one-story addition, 40 x 120 ft., to cost about $15,000.

Cincinnati

CINCINNATI, Oct. 29.

Many orders for machine tools are coming from manufacturers not engaged on Government work, and dealers in both new and second-hand machines state that the scattered inquiry for single tools was never better. Exception to this may be taken as compared with conditions three years ago when the call for machine tools was almost entirely from makers of war material for England and France and also for export to those countries. To-day the small manufacturing plants are buying machinery, not only for replacement, but also to increase their output. Orders from the South for lathes, small grinding and portable electric tools have recently increased. Pacific coast business is also better. Some trouble is being experienced in shipping machinery, due to the scarcity of cars, which does not apply, however, to machines needed for war purposes.

The Gordon Machine Co., Cincinnati, has had plans prepared for a new one-story brick plant 48 x 115 ft., to be erected at Spring Grove Avenue and Township Street.

The Fox-Klein Motor Co., Cincinnati, is having plans prepared for the erection of a three-story building 65 x 100 ft., on Gilbert Avenue, near Eighth Street. A small repair shop will be provided for automobile and auto-truck repairs.

The Standard Register Co., Dayton, Ohio, has completed an addition to its plant that will greatly increase its present output of autograph registers. Practically all the necessary equipment has been bought.

The Ohio State University, Columbus, Ohio, will open bids Dec. 3 for power plant equipment, including a stoker for a 600 hp. boiler. Specifications may be obtained from Carl E. Steeb, secretary.

Jacob Seeger, stone contractor, 697 East Fulton Street, Columbus, has purchased a quarry at Reynoldsburg, Ohio, and will need additional crushers and other equipment.

The Capital Die, Tool & Machine Co., Columbus, recently incorporated, has taken over the plant formerly operated by J. B. Hoover, at 619 North Fourth Street, where it will continue the manufacture of dies, jigs, and other small tools. The company also manufactures metal heat-treating furnaces.

The Hercules Gas Engine Co., Evansville, Ind., is making plans to double the capacity of its machine shop. Later an addition to its foundry is contemplated.

The Central South

LOUISVILLE, Oct. 29.

Second-hand machinery is in good demand. Inquiries from manufacturers and distributers of power equipment are numerous, but many orders are deferred on account of the uncertain price situation.

The Roy C. Whayne Supply Co., Louisville, is in the market for a 7½ or 10-hp. motor, 25-cycle, direct current, 220 or 440-volt; also for a 4-ton electric locomotive, 250-volt, direct current, 40-in. gage.

Truman Drury, Morganfield, Ky., is asking for addresses of manufacturers of gasoline hosting engines, with a capacity of 1½ tons, to hoist 60 ft.

The Estill Water & Gas Co., Irvine, Ky., willl purchase a pump, 225-ft. lift with a capacity of 250 gal. per min., and other equipment for a waterworks system.

The John G. Duncan Co., Knoxville, Tenn., is in the market for a second-hand, 40 or 50-hp. boiler, locomotive type preferred.

The Southern Equipment Co., Memphis, Tenn., has been incorporated with capital stock of $25,000, by R. H. McWilliams, N. M. Dickson, A. W. Fisher, Jr., and others, to do general foundry and machine shop work.

The Louisville Gas & Electric Co., Louisville, will install new generating machinery and auxiliary equipment at its electric power plant. H. M. Byllesby & Co., 208 South La Salle Street, Chicago, are the engineers.

The Peerless Sign Co., Louisville, has been incorporated with a capital of $40,000 to manufacture metal signs. Calvin F. Thomas and George C. Murphy are the principal incorporators.

Thomas H. Wright and Charles E. Taylor, Wilmington, N. C., are planning for the construction of a shipbuilding plant on the Cape Fear River.

The shipbuilding plant of the United States Maritime Co., Brunswick, Ga., site for which has been acquired in the Clubb's Creek section, will consist of six shipways, steel fabricating mill, machine shop, power plant, etc. It also arranged for the erection of about 100 houses nearby for employees.

Texas

AUSTIN, Oct. 27.

Dealers report an improvement in the demand for machinery and machine tools. It is stated that more irrigation plants will probably be installed in this section during the next few months than in any similar period for many years.

The Fireplace Hot Water Heater Co., El Paso, recently incorporated, will build a plant for the manufacture of water heaters.

Bowie will issue $15,000 in bonds for the construction of an electric light and power plant.

The municipal electric light plant at Decatur is to be equipped with a new engine and other machinery.

The City Council, Wolfe City, plans to increase the municipal water supply and will probably install a new pumping plant.

Charles Sommer and associates, Quanah, contemplate the construction of a waterworks system, including a pumping plant to cost about $150,000.

The Gulf, Colorado & Santa Fe Railroad, Temple, will build a power house and machine shop and make other improvements to cost $150,000.

J. D. Seamonds, Dilley, will install an irrigation pumping plant on the Leona River near Dilley.

California

LOS ANGELES, Oct. 23.

The Leach Motor Car Co., Los Angeles, has acquired property at Sixteenth and Figueroa streets for the erection of a three-story building, about 100 x 155 ft., to cost about $150,000. On the third floor two complete repair departments will be installed, with machine shop and tool room, etc., one for used cars and the other for new automobiles. A large parts department will be located on the second floor.

The Novelty Brass Works of California, Los Angeles, has been incorporated with a capital of $10,000 to manufacture brass goods. Louis N. and Frances Auger and Oscar W. Cave are the incorporators.

The United Light & Power Co., Los Angeles, will build an electric power plant on the San Gabriel River. The initial capacity will be about 10,000 hp. and is estimated to cost $300,000.

The Woodward Garage & Truck Attachment Co., 2619 West Pico Street, Los Angeles, has been organized to manufacture motor truck attachments. E. J. Woodward heads the company.

The Master Carburetor Co., Los Angeles has been incorporated with a capital of $200,000 to manufacture carburetors, etc. The incorporators are Charles G. Harness, George Beebe, D. F. Poyer, E. M. Chandler and J. C. Crouch.

The United States Spring Co., Los Angeles, has increased the capacity of its plant on South Los Angeles Street, to include a department for the manufacture of wire wheels and the repair of old wheels. J. F. Rauen is secretary and treasurer.

The Gilfillan Brothers Smelting & Refining Co., Los Angeles, has completed the erection of a new plant at Wall and Eleventh streets, for the manufacture of electric drills and grinders, magneto parts and motor and generator brushes.

The Los Angeles Brass Foundry, Los Angeles, has been organized to operate a plant at 1539 East Sixteenth Street. Fred Freitag heads the company.

The Pacific Gas & Electric Co., San Francisco, is building a machine shop in connection with its new generating plant near the West Side branch of the Southern Pacific Railroad, near Fresno, Cal.

The Pacific Northwest

PORTLAND, ORE., Oct. 23.

The general resumption of work at the shipyards in the Columbia River and Puget Sound sections Oct. 29 will have a big influence on the demand for machine tools. The call from lumber mills is increasing, many of which have completed plans for enlargement to meet Government or other requirements. Marine engines and other marine equipment are in active demand.

The Beebe Co., Portland, manufacturer and distributer of marine engines and motors, has opened a branch at Astoria.

The North Bend Mill & Lumber Co., North Bend, Ore., has bought the adjoining property of the North Bend Iron Works and is installing an electrically driven planing mill and lumber finishing plant, 140 x 160 ft., at a cost of about $100,000.

The Quilicum Sawmill Co., Quilicum Beach, Vancouver Island, B. C., has been incorporated with a capital stock of $25,000 to take over the business of H. S. Galbraith and to operate saw mills and build ships.

Macdonnell, Ltd., Ogden Point, Victoria, B. C., has completed plans for an assembling plant for installing marine engines and auxiliary machinery in wooden vessels now under construction in British Columbia for the British Munitions Board.

T. Danielson, Vancouver, Wash., will equip a factory on East Fifth Street for the manufacture of motor boats.

The plant of the Klamath Iron Works and the mill of the Ewauna Box Co., Klamath Falls, Ore., were recently burned with a loss of $300,000.

The American Powdered Coal Co., Portland, has bought two and one-half acres in South Portland on which it will erect a coal pulverizing plant at a cost of about $75,000.

The Ames Shipbuilding & Dry Dock Co., Seattle, has bought four lots on the water front on which it will erect a shipbuilding plant.

The Sitka Spruce Co., Coquille, Ore., has secured additional water power and will install machinery and electric lighting equipment preparatory to doubling its capacity.

The Donohoe-Rathbone Shipbuilding Co., Seattle, has been incorporated for $1,500,000, and will erect a plant to build wooden vessels. Sites in Seattle, Port Orchard and Everett are under consideration.

The J. H. Chambers sawmill, Cottage Grove, Ore., was recently destroyed by fire with a loss of $75,000. It will probably be rebuilt.

The Pacific Marine Iron Works, Portland, has completed its plant and started work on the construction of ship engines, Ballin water tube boilers and auxiliary machinery.

The Sumner K. Prescott Foundry, Seattle, will increase the capacity of its plant more than 100 per cent by construction of an addition and installation of new equipment. It is turning out lumberyard gasoline tractors, and will manufacture the Hendricks truck attachment.

The Olympic Steel Works, Seattle, which recently moved into its new foundry on the Canal Waterway, contemplates the construction of an addition to its plant to cost $10,000. It manufactures 3000 lb. of castings per day, and employs 50 foundrymen.

H. N. Bothweiler & Co., Seattle, are constructing a new plant at a cost of $25,000 to manufacture automobile appliances.

The Oceanic Shipbuilding Co., Portland, has been formed by B. G. Skulason, Isaac Gratton, D. E. Streib and P. K. Easto. It is understood a shipbuilding plant will be established.

The Belmont Iron Works, Philadelphia, has opened offices in the Arcade Building, Seattle. Murry Jacobs is in charge.

Chester Coulter, Seattle, for many years identified with machinery and equipment business in the Northwest, has formed the Coulter-Taylor Co., with offices in the L. C. Smith Building, to deal in iron and steel products, railroad equipment, etc.

The Kennedy Valve Mfg. Co., Elmira, N. Y., has opened a branch office in the Arcade Building, Seattle.

The Pacific Machine Shop & Mfg. Co., Seattle, is having plans prepared for a new machine shop at Pike Street and Railroad Avenue, to cost $15,000.

The Patterson-McDonald Shipbuilding Co., Seattle, is having plans prepared for a one-story boiler shop, 92 x 240 ft., to cost $20,000. It will also erect a two-story construction shed and mold loft, 80 x 460 ft.

Canada

TORONTO, Oct. 29.

M. J. O'Brien, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $20,000,000 by Michael J. O'Brien, Joseph L. Murray, both of Renfrew, Ont.; John A. O'Brien, Ottawa, and others, to take over the smelter, electrical plants, etc., owned by Michael J. O'Brien, at Renfrew.

The Warwick Machine Co., Ltd., Quebec, has been incorporated with a capital stock of $100,000 by Joseph E. Julien, Samuel Fleury, Joseph A. Boule, and others, to manufacture agricultural implements, saws, kneading machines, tools, etc.

The Anglo-American Shipping Co., Ltd., Montreal, has been incorporated with a capital stock of $20,000 by George V. Cousins, Aubrey H. Elder, Solomon Vineberg, and others, to build ships.

The foundry owned by Clare Brothers, Galt, Ont., was damaged by fire Oct. 19 with a loss of $15,000.

The Ignition Repair & Supply Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000, by Lawrence J. Pashler, 9 Grafton Avenue; Bertrand T. McAvoy, M. P. Van der Voort, and others, to manufacture engines, motors, batteries, magnetos, etc.

The Multipost Co. of Canada, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Donald B. Menzies, John A. Ryan, 1464 King Street West; Alpha I. Hodgins, and others, to manufacture machinery, tools, etc.

The Spruce Falls Pulp & Paper, Ltd., Spruce Falls, Ont., has been incorporated with a capital stock of $3,500,000, by Thomas H. Barton, 840 Davenport Road; Charles M. Garvey, 60 Victoria Street; Thomas M. Weatherhead, and others, of Toronto, to manufacture pulp, lumber, etc.

The Welding & Supplies Co., Ltd., 1227 Ontario Street East, Montreal, has been formed to do general oxy-acetylene welding. C. Roger, formerly Canadian manager of the L'Air Liquide Society, is manager.

The Liquid Air Co., 1 Ernest Street, Montreal, has purchased a site at Dartmouth, N. S., where it will erect an acetylene plant to cost about $40,000.

The St. Andrews Wire Works of Canada, Ltd., Watford, Ont., has taken a building at Starthroy, Ont., which it will remodel and equip for the manufacture of wire products, etc. G. M. Haldane is local manager.

The Sydney Foundry & Machine Co., Ltd., Sydney, N. S., will build a foundry at Halifax, to cost $7,500. Wilfred Clarke is manager.

The Toronto Electric Supply Works will make alterations to a factory on Hanna Avenue, Toronto, and install equipment to cost $3,000.

Bids will be received by W. A. Mitchell, clerk, Chapleau, Ont., until Nov. 15, for a turbine pump with a capacity of 400 gal., operated by 40-hp. motor. Specifications may also be had from Chipman & Power, engineers, Mail Building, Toronto.

The Ucan Specialties of Canada, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Samuel W. Jacobs, Gui C. Papineau-Couture, Louis Fitch, and others, to manufacture hardware, steel, brass, machinery, etc.

The Gold Medal Broom & Brush Co., Ltd., Laval de Montreal, Que., has been incorporated with a capital stock of $150,000 by Paul Demers, William H. Langlier, Claude Bourdier, and others, all of Montreal, to manufacture brooms, brushes, toys, etc.

The shell loading plant of the Canadian Explosives Co., Ile Perrot, near Vaudreuil, Que., was totally destroyed by fire and explosions Oct. 26 with a loss of $1,600,000.

The Magnet Metal Co., Ltd., Winnipeg, Man., has been incorporated with a capital stock of $5,000 by G. A. Maclean, H. R. Eade, G. M. Larson, and others, all of Winnipeg, to manufacture iron, steel, metals, machinery, tools, etc.

Government Purchases

WASHINGTON, Oct. 22.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening dates unassigned, schedule 1546 for two duplex milling machines, bases 29 x 33 in.; schedule 1540 for one motor-driven direct-connected squaring shear, all for Mare Island, Cal.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until 11 a. m., Nov. 5, on specifications 2562 for fuel-oil systems at Mare Island, Pearl Harbor, San Diego, and Puget Sound.

The quartermaster general of the Army has directed that purchase be made of 15,000 Army motor trucks according to the new standard type recently adopted by the War Department. It is probable that the bids will be opened by the depot quartermaster at Washington, the date of such has, however, not yet been decided. Bids will be asked for the truck body and for parts of the vehicle. It is intended to purchase 10,000 trucks of Class B type, 3 ton, and 5000 of the Class A type, 1½ ton.

The following bids were received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, Oct. 8, under specification 2541, for furnishing and installing a 10-ton electric traveling crane for pattern and machine shop at the naval station, New Orleans, La. Item 1 work complete; 2, work complete, bidder's specification.

Niles-Bement Pond Co., 111 Broadway, New York, item 2, $8,800, 360 days. Carroll Electric Co., Washington, item 2, $12,660, 275 days. Cleveland Crane & Engineering Co.,

Wickliffe, Ohio, item 2, $11,495, shipment, 180 days. The Whiting Foundry & Equipment Co., Harvey, Ill., item 1, $13,780, 180 days.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Oct. 5, for furnishing material and supplies for the naval service as follows:

Schedule 1863½, Steam Engineering, Class 41, Portsmouth and Boston—Gasoline engines and spares—Bid 8, item 1, $3,589; 2, $283.35; 3, $2,594; 4, $249.95; delivery, items 1 and 2, 5 in 8 weeks; items 3 and 4, 5 in 6 weeks, 5 in 8 weeks, 10 in 10 weeks, and 10 in 12 weeks; total $124,062; bid 18, item 1, $3,640; 2, $722.55; item 3, $3,640, $3,940, and $2,940; item 4, $722.55 and $684.05; bid 32, item 1, $3,401.50; 2, $445.41; 3, $2,669; 4, $420.61; total, $131,157.40; delivery, 90 days; bid 37, item 1, $3,795; 2, $490.40; 3, $2,750; 4, $469.20; total, $139,430; delivery, 90 days: Bid 47, item 1, $2,822; 2, $352; 3, $1,785; 4, $262; total, $93,171; delivery, 150 days.

Schedule 1905½, Steam Engineering, Class 42, Brooklyn—12 precision bench lathes—Bid 13, $485; 16, $1,165.60; 26, $658, $660 and $659; 33, $1,120, $1,165, $1,112, $1,160, $1,090, $1,425, $1,470, $1,415, $1,460, and $1,390; 38, $1,572.

Schedule 1918½, Steam Engineering, Class 81, Philadelphia—Five universal milling machines, motor driven—Bid 16, $2,985; 25, $2,873.75.

Names of the bidders and the numbers by which they are designated follow:

Bid 2, the American Laundry Machinery Co., 134 West Twenty-seventh Street, New York; 13, the Elgin Tool Works, 67 North State Street, Elgin, Ill.; 16, the Fairbanks Co., 416 Broome Street, New York; 18, Gas Engine & Power Co., and Chas. L. Seabury & Co., Consolidated, Morris Heights, N. Y.; 37, the Sterling Engine Co., 1252 Niagara Street, Buffalo, N. Y.; 47, the Niagara Motors Corporation, Dunkirk, N. Y.; 26, Kemp Machinery Co., 223 North Calvert Street, Baltimore; 33, D. Nast Machinery Co., Bourse Building, Philadelphia; 38, W. E. Shipley Machinery Co., Morris Building, Philadelphia; 25, Kearney & Trecker Co., Milwaukee, Wis.

Coal Exports to Canada Restricted

WASHINGTON, Oct. 30.—The Fuel Administration has completed statistics showing the past fuel consumption of the Dominion of Canada and the future requirements of coal for the railroads, factories, public utilities and domestic consumers of that country. On the basis of these statistics a definite allotment of coal for Canada has been made. For the next two months the allotment will total about 2,000,000 tons of bituminous and 700,000 tons of anthracite. Dr. Garfield has insisted that Canada be treated as well in the matter of coal as the States of the Union but no better. The figures referred to show that the first nine months of this year coal has been shipped into Canada in much larger quantities than in former years, so that the allotment now being made will involve a limitation not only of the amount to be exported by individual shippers but of the aggregate tonnage going into Canada the coming winter.

From this time forward the shipment of coal into Canada will be under definite control by the Fuel Administration, and only shippers with its permits will be allowed to export coal to that country. These limitations have been arranged in consultation with the Canadian authorities, who recognize that the United States is warranted in taking such steps to protect the interests of American consumers.

The Merchants Shipbuilding Co., Bristol, Pa., has awarded the contract for its new buildings to the Fred T. Ley Co., Springfield, Mass. The buildings include a molding and loft building, 200 x 300 ft., three stories; a pattern and joiner shop, a machine shop, a pump house, a transformer house, and a large addition to the power plant. Further work contemplated includes 250 six-room bungalows, 603 five, six and seven-room dwellings in groups of seven or nine each, 50 detached six or seven-room houses, a number of more expensive single houses, four 37-family apartment houses, several rooming houses for single men, two commissary buildings, administration buildings and other structures to care for the large number of employees expected.

PATRIOTIC COUNCIL

United Alloy Steel Corporation Employees Form a Novel Organization

W. A. Field, the general manager of the United Alloy Steel Corporation of Canton, Ohio, recently conceived the idea of forming an organization along the lines of the Council of National Defense, to supplement the work of that Council in the city of Canton and more especially in the plant of the United Alloy Steel Corporation.

As a step in the organizing of this council, a dinner was given in the Courtland Hotel to about 250 employees of the corporation and invited guests. The speakers of the evening were Judge Henry W. Harter, chairman of the Liberty loan campaign in the Canton district; George H. Clark, chairman of the Canton Draft Board; John Marshall, special agent of the Department of Justice; J. M. Criley of Cleveland, and Judge A. H. Head of Cincinnati.

The objects of the organization are best set forth in the opening remarks of Mr. Field, which were in part as follows: "We have come together with one aim and one object and that is for each man to take stock of himself and in his own way and with his own brains devise ways and means of using his abilities in the best possible manner in this great crisis which confronts our nation to-day. In order that we may all benefit by such thoughts and ideas as may come to each individually the idea has occurred that we organize ourselves into the Auxiliary Council of National Defense. We can do nothing of material moment alone, but we can organize into a well-regulated, systematic body along lines similar to that of a well-directed army. In this connection, I would suggest that you men here to-night observe these aims and objects carefully at the start and let all of those with whom you come in contact know exactly what this organization means and what you have made up your minds to do as your bit."

There was considerable enthusiasm displayed at the meeting and each speaker was warmly received. At the conclusion of the meeting all the men faced the flag and repeated the following pledge:

> I pledge allegiance to my Flag
> And to the Republic for which it stands.
> One Nation, indivisible,
> With liberty and justice for all.

I further agree: To do everything in my power to assist the President of the United States and all branches of the Government in bringing the war to a successful issue at the earliest possible moment. I promise to refrain from destructive criticism and to try to make my every effort count for the honor, dignity and glory of my country and its institutions.

W. A. Field was elected president, and Francis Miller, secretary and treasurer. A director was elected from each department.

The organization undertook the sale of Liberty bonds, and up to date has sold to 90 per cent of the employees, and these sales amount to about $225,000.

The firm name of H. L. Latshaw & Co., 220 Broadway, New York, has been changed to the Latshaw Steel & Metal Products Corporation. The lines handled include shafting, screw stock, cold drawn shapes, steel tubing, sheets, plates, bars, rods, wire, tool steels, etc.

The Geuder, Paeschke & Frey Co., St. Paul Avenue and Fifteenth Street, Milwaukee, Wis., has completed arrangements with the Maxim Silencer Co., Hartford, Conn., for the exclusive production and sale of Maxim silencers for motor trucks and passenger cars.

Emil F. Steiner & Co., makers of sectional and portable ovens for japanning, enameling, core drying, etc., have moved from their former location at 58 Union Street, Newark, N. J., to a new plant at 117-119 New Jersey Railroad Avenue.

Intense Patriotism at Institute Meeting

(*Continued from page 1045*)

antee does not and cannot reimburse a mill owner for loss of time and tonnage while a mistake is being made good, and the mill electrical engineer is not true to his responsibilities if he allows any modification of what experience has dictated as the line of safety, and it is to be hoped that all manufacturing companies and purchasers will be able to reach some equitable agreement on this vital detail.

Cost of Equipment

"Although frequently stated offhand that the cost of equipment for electrical devices, especially for reversing mills, is so far in excess of the cost for steam as to offset any saving in operating cost that may be shown, the statement does not appear to be borne out by a close analysis of the subject. For the straight running mills, the comparison of first cost of equipment may be less favorable to the electric drive than with the reversing mill.

"With the steam drive, the boiler house must be located quite near the mill to avoid long steam lines, which, often involving costly engineering details, do not tend to concentrate the plant. If condensing engines are used, the large amount of water required may have to be carried for a considerable distance to the engine. All of this is avoided with the electric drive, as the power station and boilers may be located at the most convenient place, not necessarily inside the plant, where fuel and water can be supplied at a minimum cost.

"On reversing mills, the actual consumption of steam with electric drive will probably be about half of the equivalent steam drive, but in this case the peak load must be taken into consideration, as it may represent from four to five times the normal power required, and, in the case of the steam-reversing engine, it must be absorbed by the boiler. With the electric drive, this shock is almost entirely taken up by the motor generator fly-wheel set which is interposed between the line and the main motor so that on an average only one-seventh of the peak load is thrown back on the boiler plant.

"Where a saving of three-fourths of the coal used for power generation can be shown, the substitution of electric power for steam becomes as much an economic necessity as the use of the by-product coke oven.

Costs of Operation

"The comparison of actual money costs in the operation of electric motor with other methods is difficult and more or less unsatisfactory on account of the differences in cost of power, works organization and accounting systems, so that all comparisons here are made on a basis of kilowatt-hours per ton of product. Even this is only approximate as the applications of electric power vary in different plants and the finished product, sizes of ingots, drafts used, temperature and composition of steel rolled all enter into the main roll problem. However, some approximate figures have been arrived at which are given below, although probably subject to further modification as more data become available.

Kilowatt-hours, per ton of pig iron produced.....10.25
Kilowatt-hours, per ton of open-hearth steel produced.. 4.15

"In the rolling mills the diversity is so great as to make anything like accurate estimating equivalents practically impossible, but the following will give some idea of what to expect, although they are not directly comparable:

Non-Reversing Mills, Electric Drive

Raw Material	Finished Material	Main Rolls Kw.-Hrs. per Ton
7 x 7 in.	30-lb. rail	60
6 x 7 in.	3½ to 8-in. angles	33
22 x 22 in.	Standard rail	46
20 x 24 in.	4 x 4 in.	31

Reversing Mills, Electric Drive

20 x 20 in.	5 x 5 in.	25.5
20 x 20 in.	8 x 8 in.	17.0
18 x 20 in.	4 x 4 in.	26.0

"As the mill requirements can be readily determined, these figures are only indications and each problem should be the subject of special calculation.

Historical

"The first large installation of electric motors was made at Edgar Thomson Works in 1905 for rolling light rails, where power equal to 3000 kw. was generated and transmitted for a short distance only at 250 volts d.c., the equipment being in perfect operating condition today. The latest installation was at Homestead Steel Works on a 110-in. plate mill, where a 25-cycle alternating current equivalent to 3000 kw. is transmitted at least three miles at 6600 volts. This mill was started Oct. 15 of this year, less than six months after breaking ground, the electric drive being finished in five months from placing of the order.

"Between these two dates there have been installed in the United States 170 non-reversing rolling mill drives of over 1000 hp. capacity. The first large reversing equipment using the Ilinger system in this country was installed at Illinois Steel Co. in 1907, after which only two equipments were built in the following ten years. The rapid development of this class of equipment began in 1916, for there are on record 15 plants from 8000 to 15,000 hp. maximum rating operating or to be installed during 1917, and up to date five equipments from 9000 to 19,000 hp. for 1918 delivery.

"It would therefore appear that the electric motor has proved itself to be wholly reliable, extremely adaptable, not excessive in first cost and very economical to operate, and there should be no question as to its general adoption."

Malleable Iron and Its Uses Discussed

Paper Read by President Pope, of the National Malleable Castings Co.—Question Why Use Malleable Instead of Steel Castings Considered

The paper by Henry F. Pope, president of the National Malleable Castings Co., Cleveland, on "Malleable Iron and Its Uses," was as follows:

"It is well to give a little time to the consideration of malleable iron, for by many its characteristics are little understood.

"Iron as it is run from the furnace and poured into the molds, in the process of making malleable iron castings, is not malleable at all, but is extremely hard and brittle. When broken, it shows a white fracture. But this brittle iron is of such composition that when subjected to the proper annealing heat for the requisite length of time, it is transformed into an iron with entirely different physical qualities. After annealing, instead of showing a white fracture, it shows a black one, giving it the name of 'black heart.' This distinguishes the malleable iron made in this country from that made on the continent of Europe, which has a steely fracture due to the fact that the carbon is almost entirely removed by oxidation in the annealing process. Graphitization of the carbon is more easily controlled commercially than oxidation: therefore, the 'black heart' is the more reliable product. The black fracture of our iron is due to the fact that in the annealing process the carbon, which in the original casting was all combined, has been separated out by decarbonization and is now found as free carbon or graphite of non-crystalline form deposited between the molecules of the iron. This form of carbon is called 'temper carbon' by Ledebur to distinguish it from its other forms. The presence of a large amount of temper carbon gives the material its black appearance.

"The iron itself, therefore, is left almost entirely free from any combination with carbon and possesses the malleable quality of wrought iron. It can be bent without fracture and withstands great shock and stress without breaking. It has the superiority of wrought iron in the respect of malleability without the sometimes objectionable fibrous structure of that material and with the very great advantage that it can be cast into all sorts of intricate shapes without difficulty, saving the large cost of laboriously shaping and building up the wrought iron. And this is not belittling wrought iron, which has its important place. Often combinations of wrought and malleable iron are made in a structure with very distinct gain.

"Some one will say: 'Why use malleable iron any more when steel castings may be had?' Well, that is a very plausible question, for great strides have been made in steel casting production and certain castings have been changed from malleable iron to steel with improved results, but there are several reasons why steel will never displace malleable iron for a multitude of articles. In the first place, in most cases if the steel could be produced in the form and section of the malleable casting, it would be more expensive and no better, for it must be remembered that while the tensile strength of malleable iron is somewhat below that of soft steel, its elastic limit is just as high, which means that it will stand just as much punishment as the steel. Furthermore, it is easier and cheaper to produce many articles in malleable iron. The iron is fluid at a much lower temperature than steel. To procure steel as fluid as the iron costs more and when the fluid steel, at a high temperature, is poured into the mold, much more difficulty and expense are encountered than with the cooler iron; the problems of the foundry are comparatively simple in the case of the iron.

Poor Iron Brings Discredit

"Malleable iron has, unfortunately, not been produced in conformity with the best standards by all of its makers, and the poor iron made by some has brought much discredit upon the industry, as a whole. There is no justification for this, because the inferior metal can be easily distinguished from the good by the examination of the fractures of removed test lugs. All important castings should have test lugs cast on them for this purpose. Many manufacturers have, however, for several years, given serious scientific study to their product with wonderfully good results, so that from many of them malleable iron can now be obtained of uniform quality and of greatly increased tensile strength without any sacrifice of ductility, for one peculiar feature of malleable iron is that while the tensile strength increases, the elongation also increases. This is not true of any other commercial metal. There are two essentials necessary in the production of malleable iron. One is the proper composition of the hard iron and the other the proper heat treatment in the annealing process. With increased knowledge and with better practice, the former has been greatly improved and the latter is secured by a proper observation of the temperatures. The excellence of malleable iron will doubtless be greatly increased by the use of the electric furnace, which insures certainty of proper mixture before the iron is poured, besides eliminating objectionable oxides.

"Malleable iron, then, due to its unique qualities, has a usefulness which is entirely its own and which cannot be taken away. Years ago it began to be used advantageously for agricultural implements, all sorts of farm tools, wagons and carriages, harness, stoves, pipe fittings, and for many other purposes. Later, the railroads began to use it, for many parts of the car could be made lighter and less subject to fracture by the substitution of malleable for gray iron. The railroads use it also in places where the iron is exposed to the corrosive action of the weather, for malleable iron is as non-corrosive as any of the iron products and much more so than steel. Tie-plates, for instance, ought to be made entirely of malleable iron, for the corrosion of the steel makes it much more expensive in the end. More recently the malleability, the lightness and the good machining qualities of malleable iron, as well as the fact that it could be cast into desired shapes with ease, have made malleable iron very popular for use in automobile construction. Malleable iron has other good qualities. Its permeability is as high as soft steel and its magnetic hysteresis is less. These qualities render this material very desirable for certain electrical machinery.

"It is seen, therefore, how important a place malleable iron holds in the iron and steel industry."

Great Importance of the Scrap Business

W. Vernon Phillips Gives Some Very Interesting Statistics and Describes Ways of Handling Iron and Steel—Subject Never Before Discussed Before Institute

In his paper on "Iron and Steel Scrap" W. Vernon Phillips of the Perry Buxton Doane Co., Philadelphia, said:

"I have been asked to address you on a subject which Mr. Farrell tells me has never before been put before you, namely, iron and steel scrap, and I feel very fortunate in having the opportunity to tread on virgin ground. The subject, however, is such a broad one that I can only touch upon certain features, but I hope it will leave the way open for further and more scientific discussions, which I am sure will be both interesting and helpful to both the producer and consumer. For the present, my purpose shall be to acquaint you with the great importance of this too lightly regarded business—we can not call it an industry, though it is fast approaching that stage.

Importance of the Business

"But first let me point out its importance as a business. For instance, it is second only to pig iron in point of tonnage. The total consumption of iron and steel scrap in the year 1916, over and above that made by the consumer, was in excess of 12,000,000 tons, exclusive of cast-iron scrap and material used for chemical and other unusual purposes, also exclusive of the large tonnage of borings and turnings used in the blast furnaces, all of which would make an additional 2,000,000 to 5,000,000 tons, but we are without statistics, or the present opportunity to secure them on this tonnage, so we will confine our consideration for the present to the 12,114,000 tons consumed in 1916, which represents 9,646,617 tons of iron and steel scrap melted in open-hearth basic and acid furnaces including a small tonnage which was used in electric furnaces. Of the remainder, approximately 2,000,000 tons was worked in rolling mills by the various methods employed, namely, busheling, puddling, piling and direct rolling into bar iron and soft steel, while over 600,000 tons was converted by mills rolling old rails down to lighter sections, to angles, to concrete bars and including axles, shafting, etc., rolled to steel bars.

"During the present year the increased open-hearth capacity will probably have called for at least 2,000,000 tons more scrap than in 1916; in fact, due to the inability of pig iron to keep up with the demand, such enormous calls were made on the scrap business that prices were advanced nearly 100 per cent. However, this had the desired effect and scrap was brought to the consumer from the remotest parts of the country and including many points out of the country, so that the price quickly receded with the satisfied demand.

"As I said before, we have no means of accurately estimating the tonnage, but from the figures available, we can safely say that during 1917 there will be consumed over 15,000,000 tons of all grades of iron and steel scrap, valued at about $400,000,000; in fact, many of you will probably be surprised to learn that there are single companies doing an annual business of over

$50,000,000 and a great many whose turnover exceeds $10,000,000.

"You will see by now that my prime object is to impress you with the importance of this business, for the simple reason that it has been so hopelessly misunderstood and it was not until the United States entered the war and began to take serious stock of itself that the subject was considered of sufficient importance to be recognized. As an illustration, when the subcommittee on iron and steel scrap was appointed in connection with the Council of Defense, one paper seriously remarked that even the humble scrap dealer was to be called on for help.

The Sources of Supply

"There is also an erroneous impression regarding the source of iron and steel scrap and it is likely that not half a dozen men in the industry would figure the same way, but it is the opinion of authoritative judges that 25 per cent of all the iron and steel scrap is produced by the railroads, 40 per cent by the industrial plants in the form of new crop ends, structural crops, ship plate, stampings, turnings and borings; the other 35 per cent is shipped by scrap yards of which probably one-half consists of railroad and industrial scrap sent to the yards to be sheared and prepared, leaving 15 per cent to 20 per cent which is collected by the junk dealers. But while the collection of old agricultural house and city scrap represents a comparatively small portion of the entire production, it is at the present time a most important part, as *that* is the only source which can be increased. The railroads are producing less, due to labor conditions; industrial plants can only produce scrap in proportion to the amount of the steel they receive, while all scrap which comes from replacements is smaller in volume, due to the great difficulty in replacing machinery or equipment of any kind. Besides, we are shipping millions and millions of tons of our steel out of the country, from which we are getting no scrap and will get no scrap; and, in addition, the trade is being called upon to ship thousands of tons of scrap itself. Italy, in particular, has been starving for steel scrap, and there has already been shipped out over half a million tons. The Government has taken a hand in this, as it will in many ways, to regulate this business during the war; but if the war keeps up long, we shall soon reach a point where iron and steel scrap will become a vital matter, and I want to use this opportunity to impress all of you with the importance of regarding this subject seriously.

The Need of the Dealer in Scrap

"You are all either consumers or producers of scrap. There are *millions* of producers and *hundreds* of consumers who are served by *thousands* of dealers who are in turn served. The hundreds have always used this great advantage to discourage and discredit the thousands by the very simple, though probably innocent, expedient of buying something they want, but something the dealer can not always deliver. This is at the root of all the so-called dishonesty in the scrap business. In normal time, the competition is very severe and the scrap dealers go beyond their own powers in their efforts to please the buyer.

"Scrap is not produced, it is a by-product or a discard of something and it can rarely conform to specifications calling for strict sizes, weights, shapes and characters, especially under existing circumstances, when the stock piles of the country have been depleted, with labor scarce and unwilling, and with shipping facilities so limited. The greatest good a buyer can do to-day is to buy what the dealer or producer has to sell, rather than to buy something which he has to try to get out and get.

"Scrap has no value without a demand. For instance, when I was in the tin-plate manufacturing business about 20 years ago, we were always at a loss to know what to do with our tin-plate clippings or what is known as tin snap, and we paid money to have it hauled to the dump. Within a few years, Dr. Goldschmidt discovered a method of detinning, producing chloride of tin and oxide of tin and removing 97 per cent of the metal, leaving the residue of steel sufficiently free from tin to be used in the open-hearth furnace, the black sheet trimmings left being hydraulically compressed. The detinning business has greatly expanded; tin scrap became a commodity and ever since has had a market value.

The Value of Scrap

"The value of iron and steel scrap is in exact proportion to the value of material it replaces. Thus United States steel scrap is based on basic pig iron and over the last 15 years has sold at approximately 10 per cent less than the delivered price of pig iron at Pittsburgh. In all other sections, the percentage below pig iron has been greater, due to the increased cost of delivering pig iron and the fact that Pittsburgh is usually the highest market for steel scrap, it being the largest consumer and a relatively smaller producer. All other grades of steel scrap down to light turnings are worth their relative value to No. 1 steel scrap; but scrap does not always bring its intrinsic value, as it is entirely based on supply and demand. Steel scrap has frequently sold above basic pig iron, though not in the last few years, and there has usually been sufficient scrap to keep it well below its parity. Thus we come back to the same point that scrap is worth only the price that it will bring. It has no manufacturing cost basis.

Helping the Government

"The larger dealers in the iron and steel scrap business met immediately after the declaration of war and formed an association known as the American Board of Scrap Iron Dealers, for the sole and specific purpose of furnishing the Government with help and information. Up to the present time, the sub-committee of the American Iron and Steel Institute has been cooperating with the various Governmental boards and commissions; but now that the plans are to be put into actual operation, the American Board of Scrap Iron Dealers is about to take up the work of establishing and maintaining bureaus for the purpose of assisting in that most serious of questions, transportation, working in harmony with the American Railway Association, and also for the purpose of eliminating in so far as possible the question of rejection, and I speak for it in asking the heartiest co-operation of all the consumers. Do not reject unless you have to. Do not reject for technicalities. Do not reject because the price has declined, but when you find what is known as a doctored car (for the information of the uninitiated, a doctored car contains good scrap on top and poor scrap underneath) do not take it under any circumstances, and if possible, do not let anybody else take it; have it returned to the shipper and report him to the bureau. There are men in the business who give it a bad name and this is a good time to get rid of all bad men.

Some Interesting Features of the Scrap Business

"I have been talking in a purely elementary manner. I have not touched on the grades, classes and specifications nor on the peculiar nature of this most interesting business. It is unlike any other large business. The competition is to buy, not to sell. There are a hundred different kinds of iron and steel scrap, and possibly a hundred different users. It is the business of a scrap dealer to know what each mill uses and wants and what each producer makes. People often ask why the seller does not buy back the scrap from his own steel; but only in rare cases can he use it in the form it is made, and even then some other user needs it more than he does and is willing to pay a higher price. There is a use for every kind of scrap made; and while economists are making this wonderful discovery, it has long been known to the scrap dealer and there is no such thing as waste to-day.

"The successful scrap dealer must not only know his own business but that of each of his consumers, and the better he is informed the better he can serve them. He has yards all over the country to-day that are really manufacturing plants representing millions of dollars of investment in land, buildings, shears,

drops, cranes, presses, locomotives, magnets, etc., many of these yards representing an outlay of several hundred thousand dollars. These yards are steadily growing and they will soon be supplying 50 per cent of the scrap requirements of the country. The old idea of storing scrap and selling on a high market has disappeared, at least for the present. The unprepared scrap comes in at one end, so to speak, goes through its various operations and goes out the other end prepared and ready for the charging box, rolling mill or foundry, as the case may be.

"I fear I have tired many of you, but the subject is such an endless one that I fear it must wait for a future time when it may be discussed under its various headings. I would like to tell of the wonderful, yet unorganized, system by which this great volume of material reaches its markets, of the methods of financing in which many dealers virtually act as bankers, of the short selling and long buying and of many amusing incidents in connection with the ignorant, small dealer's efforts to market his material, also of the methods employed in the scrap business abroad, particularly in England and Germany, where scrap has become of such prime importance as a result of the war, but I fear that I have already overstepped my privilege and must thank you for the interest you have shown in this rather general description."

NEW TRADE PUBLICATIONS

Piston Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-308-25. Illustrations and descriptive matter explain the construction and operation of a line of duplex piston pattern pumps. A short statement of the uses of the pump, which is designed for general service work where the water pressure is not more than 150 lb. per sq. in. and where a direct-acting steam pump is the proper piece of apparatus to use, is briefly given. This is followed by illustrations and brief descriptions of the various forms and types of the pump. As a rule, two pages are given to each style, an illustration of the pump being presented on one page with a concise description and condensed table of sizes and capacities on the facing one. Mention is made of accessories such as check and foot valves and a strainer box and strainer for use in the suction pipe to prevent foreign matter from entering the pump. A numbered list of parts and instructions on setting the steam slide valves are included.

Silent Chain Drives.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Book No. 342. Describes a line of casings for the company's silent chain drives and points out the precautions to be observed in lubricating them. Drawings of the standard casing and the various arrangements that can be supplied are included.

Electric Mine Hoists.—Wellman-Seaver-Morgan Co., Cleveland. Bulletin. Calls attention to the advantages of the application of electric power to mine hoists. Descriptions and specifications of the various types are given with illustrations showing hoisting units that have been installed for a number of iron ore, copper, gold and coal mining companies.

Pipe and Boiler Covering.—Magnesia Association of America, 702 Bulletin Building, Philadelphia. Booklet. Is a study of the cause and prevention of heat losses in the transmission of steam for power or heating purposes, the object being to present the latest and best information on heat insulation. The history of the development of magnesia boiler and pipe covering is briefly touched upon followed by a discussion of the subjects of heat and heat losses, how heat escapes, some properties of steam and the use of pipe covering to reduce heat losses. The manufacture and application of 85 per cent Magnesia coverings is gone into at some length and condensed information on the correct thickness and application of the covering for every form of steam service is given. The text is supplemented by numerous illustrations of buildings in which the coverings have been installed, as well as a number of views of the installations of the coverings themselves.

Air Compressors.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Two bulletins. The first, No. 75-C, gives a description of an angle-compound air compressor designed for either belt or direct-connected drive. The uses and advantages of the compressor are briefly touched upon, the text being supplemented by numerous views of installations and the various parts of the compressor. The other bulletin, No. 75-F, relates to a tandem compound Corliss type of compressor. The advantages of small steam consumption, little floor space, flexible capacity and a minimum amount of attendance and repairs are brought out in a series of short paragraphs, followed by a detailed description of the construction of the compressor. As was the case with the other bulletin, views of installations are included as well as illustrations of the various parts. In both bulletins condensed specification tables are presented.

Grinding Machines.—Diamond Machine Co., P. O. Box 1188, Providence, R. I. Two bulletins. The first deals with a line of disk grinding machines for all classes of materials. Each machine is given a separate sheet in the bulletin with an engraving, brief description and condensed table of specifications. The various accessories that can be supplied for use with the machines are mentioned. The other bulletin treats of the part played by the face grinding machine in modern manufacturing. It is made up entirely of loose leaves, each of which relates to some installation of this type of machine in an industrial establishment. In every case a view of the machine and the work turned out by it is given, together with data on the operations that are performed. The plants covered include automobile, aircraft motor, tractor, electric motor, pump, automatic stoker and plow factories and railroad shops.

Induction Motors.—Crocker-Wheeler Co., Ampere, N. J. Bulletin No. 182. Treats of a line of squirrel cage induction motors designed for constant speed operation on 60-cycle polyphase circuits. The construction of the motor, which is built in sizes ranging from ½ to 3 hp., is gone into at some length, the text being supplemented by numerous illustrations. An illustrated description of the motor appeared in THE IRON AGE, Oct. 11, 1917.

Air Conditioning and Drying Equipment.—Carrier Engineering Corporation, 39 Cortlandt Street, New York. Folder. Contains a list of some of the industries using air conditioning and drying equipment. Among those included are munition plants, printing establishments; rubber, tin can, electric light and automobile factories; silk and paper mills and moving picture producers, etc. Illustrations of typical installations for humidifying and dehumidifying air are presented.

Optical Pyrometers.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Bulletin No. 860. Describes an optical pyrometer for works' use which was illustrated in THE IRON AGE, Aug. 2, 1917. The pyrometer makes use of a small tungsten lamp, the filament of which shows against the background formed by the object looked at. The current through the lamp filament is adjusted until it merges or disappears in the background, this arrangement serving to measure the temperature of the body.

Screw Products.—Corbin Screw Corporation, New Britain, Conn. Catalog. Illustrates a full line of screw products including wood, machine, cap, set and special screws, bolts of all descriptions, nuts, etc. There is practically no descriptive matter in the catalog, illustrations of the various products and tables of the sizes in which they can be supplied being relied upon to tell the story. Mention is also made of the facilities which the corporation has for turning out special work.

Oxy-Acetylene Welding and Cutting.—Prest-O-Lite Company, Inc., Indianapolis. Book No. 5. Pertains to the possibilities of reclaiming broken and worn machinery and metal parts by the oxy-acetylene process. Representative examples of reclamation welding work in practically every field of the industrial world are shown. The applications of the process to general manufacturing work are also mentioned.

Wire and Wire Products.—Wright Wire Co., Worcester, Mass. Catalog. Embodies a brief historical account of the development of the company with short descriptions of its products. The text is supplemented by numerous illustrations of the different departments of the factory and the goods produced therein.

Pipe and Pipe Fittings.—Pittsburgh Piping & Equipment Co., Thirty-fifth and Smallman Streets, Pittsburgh. 1917 tables of standards. List the various kinds of pipe and fittings which the company is prepared to supply, together with dimension tables and diagrams. The tables, which are in looseleaf form, are punched for binding and are printed on thin paper so that they can be blueprinted if desired.

Pot Valve Pressure Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-500-25. Describes and illustrates a line of pressure pumps of the pot valve type where the pressure is 150 lb. or more. A brief description of the water end of the pump is presented, followed by others of the different styles of pumps, a pair of facing pages being given to each kind. Mention is made of a line of pumping engines, condensing apparatus and various types of pumps that can be supplied.